San Mateo County
Comprehensive Bicycle Route Plan

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City/County Association of Governments

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Executive Summary

The recent and continuing land use changes within San Mateo County, along with the community's desire for bicycle friendly streets that serve commuters and recreational riders alike, call for a comprehensive Bicycle Route Plan. A safe and effective bikeway network throughout the County enhances the quality of life for residents as well as attracts visitors who wish to explore the County's scenic routes by bicycle. The plan addresses issues of safety, access, quality of life and the effective implementation of bikeways.

Outlined in the plan are a detailed set of policies, goals and objectives designed to be in concert with the County's and Cities General Plans, the Cities Bicycle Plans, as well as other relevant regional plans. These policies address important issues related to San Mateo County's bikeways such as, planning, community involvement, utilization of existing resources, facility design, multi-modal integration, safety and education, support facilities and programs, funding, implementation and maintenance.

The short-to-mid-term top recommended projects in the Plan include:

1. North-South Bikeway Project: this initial phase consists of installing bikeway signing and signal detectors along a north-south bikeway between San Francisco and Palo Alto, the spine of the County bikeway system;

2. Colma-Millbrae Bikeway: an important link in the north-south bikeway system, includes on-street and off-street improvements between Millbrae and Colma to be constructed in conjuction with the BART-SFO extension project.

3. Ralston Bikeway: improvements are targeted on this important east-west link at El Camino Real and U.S. 101 interchanges.

4. North-South Bikeway (Southern Segment): on-street bikeway improvements ranging from bike lanes to wider curb lanes and shoulders from Menlo Park to downtown Redwood City.

5. San Mateo County Bay Trail: closure of a key gap on the Bay Trail in Redwood City and San Carlos. This project must overcome numerous physical, operating, property, and environmental hurdles.

6. Recreational Route Improvements: spot and corridor improvements on major recreational bicycling routes including Canada, Mountain Home, Alpine, La Honda, and Skyline.

7. North Coast Bikeway: providing a bicycle connection between Pacifica, Daly City, and San Francisco along the coastal corridor.

8. North-South Bikeway (Old County Road Section): in the heart of San Mateo County, bikeway improvements here will range from bike lanes to wider curb lanes, plus an enhanced connection through the Bay Meadows parking lot.

9. Coastside Bicycle Projects: spot and corridor improvements along Highway 92 between Half Moon Bay and Highway 35 (including improvements to the SR 92/SR 35 intersection), and extensions of the Coastside Trail along the shoreline north and south of Half Moon Bay.

10. U.S. 101/Willow Road Interchange: this location was identified as a major constraint to bicycle commuting in the southern part of the County, and especially for bicyclists connecting to East Palo Alto and the Dumbarton Bridge. The Plan identifies a series of potential improvements, requiring a feasibility study with Caltrans involvement to select the most appropriate treatment.

11. North-South Bikeway (Bayshore Section): possibly the corridor with the highest traffic volumes and most constraints on the north-south bikeway, this section in South San Francisco and San Bruno connects to San Francisco via Bayshore Boulevard and Tunnel Road.

12. U.S. 101/Broadway Interchange: like many Bayshore Freeway interchanges in the County, this interchange in Burlingame is the only east-west connector for many bicyclists and is a major barrier. The Plan identifies a series of potential improvements, requiring a feasibility study with Caltrans involvement to select the most appropriate treatment.

13. North-South Bikeway (Delaware/California Section): One of the last pieces of the north-south system, improvements to this section through San Mateo, Burlingame, and into Millbrae will range from bike lanes to wide curb lanes wherever feasible and needed.

14. Crystal Springs/3rd/4th Avenue Bikeway: bikeway improvements on this central county east-west connector between the Sawyer Camp Bicycle Trail, downtown San Mateo, and the Bay Trail.

15. SFIA Bay Trail/Commuter Bikeway: this corridor on the east side of U.S. 101 between Burlingame and South San Francisco is slated to address both recreational and commuter demand. A Bay Trail alignment has been identified for this corridor: bicyclists have requested that a more direct route be studied in this corridor that would not involve crossing the Bayshore Freeway.

These projects will require additional feasibility work to determine the final alignment and best type of improvement to be made, given detailed information on physical and operating conditions. The Plan focuses attention on these locations and corridors, providing the impetus to resolve design and funding issues.

In all cases bikeway projects identified in this plan will require local adoption and sponsorship, which typically includes a local matching requirement. This plan is a resource and coordinating document for San Mateo County: it does not supercede locally adopted plans. The plan identifies numerous un-funded policies, projects, and programs. By adopting this plan, a local agency would be endorsing the concepts in the plan that are subject to further review and refinement by local agencies.

Along with the completion of a comprehensive bikeway network, the plan calls for new educational and promotional programs to be implemented over the 20-year life of the Plan. The plan provides a detailed proposal for enhancements to safety education and marketing, including strategies to educate both bicyclists and motorists, improvements to curriculum, and marketing techniques to raise public awareness to the rules of the road. The plan recommends that the implementation of bikeways, facilities and signage follow adopted Caltrans standards. Proposals that do not meet current standards should be individually reviewed and approved by Caltrans before implementation. The Design and Maintenance element of the Plan outlines specific standards and guidelines pertaining to San Mateo County's bikeways.

The plan positions San Mateo County to successfully compete for state and federal funding from which to implement the recommended projects. The total short to mid-term costs (years 1-10) for bicycle projects identified in the plan is estimated at 28 million ($2000). Bicycle *program* costs are estimated to be $85,000 per year, a fraction of which would be local agency responsibility. The County and local agencies would be responsible for about 13% of bicycle *project* costs amounting to an estimated $309,000 per year, with the remaining $2.5 million per year coming from Federal, state, and regional sources.

There are a variety of potential bicycle and pedestrian funding sources including local, state, regional and federal funding programs that can be used to construct the proposed bikeway network improvements. The application process for many of the funding sources is competitive and in many cases requires an adopted bicycle master plan. Regional funding is primarily obtained from the Air Quality Management District through Transportation Fund for Clean Air grants, state funding typically comes from the Transportation Development Act (TDA) funds, and federal funding comes from newly adopted TEA-21 legislation. Detailed information on these as well as additional funding sources are outlined in the implementation section of this Plan. The Plan recommends implementing projects as funding becomes available and implementing short-to-mid-term and less expensive projects first.

Why does San Mateo County need a Comprehensive Bicycle Route Plan?

San Mateo County, located on a peninsula immediately south of San Francisco, boasts a wide variety of natural settings including beautiful coastal mountains and pristine beaches as well as numerous prominent institutions, local and regional parks, cultural centers and historic landmarks. Residents enjoy variety of cultural amenities and businesses within each city that provide a wide variety of entertainment and employment opportunities including the world-renown Silicon Valley.

Framed by the Pacific coast on the west and San Francisco Bay on the east, the County is connected to San Francisco, the South Bay and the East Bay by several major transportation corridors. Highway 101 (Bayshore Freeway) and Interstate 280 are parallel north-south corridors through the County connecting from San Francisco in the north and into Santa Clara County to the south. Highway 92 transverses the County, east-west, from Half Moon Bay on the Pacific side to the San Mateo Bridge. As a major Bay Area employment center, San Mateo's freeways are highly congested during commute hours. Scenic State Highway One follows the County's coastline and attracts tourists and residents during the weekends and holiday seasons.

The County is connected to other regional centers by scheduled transit and commuter rail service provided by SamTrans, Caltrain and the Bay Area Rapid Transit (BART) system. Caltrain serves as an important commuter rail service between San Francisco and San Jose. San Francisco International Airport (SFIA) is located in San Bruno and is the largest airport in Northern California with several major expansion projects underway. SamTrans provides local and express bus service within the County and into adjacent communities.

San Mateo County has become known worldwide for its burgeoning high-tech center, developing cutting-edge technologies in computer, software, and scientific applications. The area is also known for its charming, rustic, fishing villages and lighthouses found up and down along the coast where visitors and residents can enjoy the beaches, fresh seafood, and shopping from local artisans.

Why does San Mateo County need a Comprehensive Bicycle Route Plan? One reason is the growing popularity of cycling for commute and recreational purposes in San Mateo and the subsequent need to coordinate the numerous bicycle plans among the County's 20 cities to ensure the development of a cohesive, consistent and quality bikeway system throughout the County.

Simply put, visitors and residents alike desire to get out of their cars and bicycle along the beautiful coastline, and through diverse urban areas. In order to achieve this goal, the bicycling environment in San Mateo County must be enhanced. Since bicycling is one of the most popular forms of recreational activity in the United States (with 46% of Americans bicycling for pleasure), we can assume that about 330,000 residents in San Mateo County bicycle purely for pleasure at least occasionally. Having a planning document that identifies facility priorities will enable local jurisdictions to create an attractive and usable infrastructure that will enhance the enjoyment and quality of life for the residents of San Mateo County.

Safety is a primary reason to improve bicycling conditions in San Mateo County. Concerns for safety is the single greatest reason people don't commute by bicycle, according to a 1991 Lou Harris Poll. Addressing those concerns for bicyclists through physical and program improvements is another major objective of this Comprehensive Bicycle Route Plan.

What are the Four Issues that San Mateo County must address to become a Bicycle-Friendly County?

Safety, access, quality of life, and effective implementation are imperative elements for San Mateo County s success as a bicycle-friendly county.

Safety is the number one concern of citizens, whether they are avid or casual recreational cyclists or bicycle commuters. Some of the central safety concerns for San Mateo County residents include high volumes of traffic on major arterials, difficult crossings along busy corridors and at interchanges, narrow and congested roadways with inadequate shoulder width and surfacing for bicycles and curving, steep mountainous roads.

Access for bicyclists to shopping, work, recreation, school, and other destinations are somewhat hampered by heavy traffic on El Camino Real, Highway 101, and I-280. Bicycle travel between cities is also difficult due to discontinuous street patterns. However, transit connections via Caltrain (which allow bicycles on-board) and SamTrans bus service which are equipped with bike racks, help to close gaps between cities.

This Plan urges San Mateo County and its jurisdictions to take measurable steps toward the goal of improving every San Mateo County citizen's **Quality of Life**, creating a more sustainable environment, reducing traffic congestion, vehicle exhaust emissions, noise, and energy consumption. The importance of developing a bicycle system that is attractive and inviting is a key element in preserving San Mateo County as a place where people want to live, work, and visit. The attractiveness of the environment not only invites bicyclists to explore San Mateo County, but more importantly, a comprehensive bicycle system helps to improve positive feelings about the quality of life in San Mateo County.

Education, enforcement, engineering, and funding are the basic components of an **Effective Implementation** Program for this Plan. Education must be targeted to the bicyclist as well as to the motorist regarding the rights and responsibilities of the bicyclist and automobile driver. Comprehensive enforcement of existing traffic and parking laws, coupled with the implementation of sound design and engineering principles for bike corridors is also critical. This plan proposes a primary network of north-south and east-west bicycle corridors. Finally, this plan proposes an aggressive strategy for obtaining grants and competing for other funding sources in order to realize the physical improvements identified as the highest priorities.

Expected Benefits of the Comprehensive Bicycle Route Plan

Save lives. Reduce the accident and fatality rate for bicyclists through design standards and guidelines, education, and enforcement.

Provide needed facilities and services. Meet the demand for increased use of bicycles as a means of travel around the County. With a goal of doubling bicycling by 2010, the bicycle commute share would increase from 2606 commuters to 5,212 commuters--which at 1.5% of the total commuting population is about 50% higher than the current national average.

Improve the quality of life in San Mateo County. Plan and implement bicycle-friendly streets, paths, and activity centers available to everyone, and support sustainable community development. Reduce traffic congestion, vehicle exhaust emissions, noise and energy consumption by encouraging a healthier and more active form of travel. Encourage visitors to enjoy San Mateo County on bicycle.

Maximize funding sources for implementation. Equip San Mateo County to successfully compete for state and federal funding, by meeting the requirements of the California Bicycle Transportation Act and the Transportation Efficiency Act for the 21st Century

(TEA-21). Provide a coordinating framework for the Cities and agencies in the County to maximize multi-jurisdictional funding opportunities.

Major Recommendations of the Comprehensive Bicycle Route Plan

The San Mateo Comprehensive Bicycle Route Plan recommends the completion of a comprehensive Countywide Bikeway Network, a refinement in the way bicycle projects in the County are funded, to help cities identify, prioritize, and fund portions of the Countywide bicycle network, and implementation of new programs to be implemented over the 20-year life of the Plan. Specific short-to-mid-term projects that are detailed later in this report include:

1. North-South Bikeway Project: this initial phase consists of installing bikeway signing and signal detectors along a north-south bikeway between San Francisco and Palo Alto, the spine of the County bikeway system;

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These projects will require additional feasibility work to determine the best type of improvement to be made, given detailed information on physical and operating conditions. The Plan focuses attention on these locations and corridors, providing the impetus to resolve design and funding issues. For other projects, the Plan provides more general planning and design guidance that serve as tools to be used by the local agencies and public as the need arises. For example, the Plan provides a detailed school commute corridor approach that can be used by local communities to evaluate and select school commute patterns. In all cases, the recommendations of the Plan are advisory and must be adopted and implemented by local agencies as they see fit.

Numerous programs and smaller projects are also included in the short and mid-term list of recommended projects, and are detailed later in this report, as are specific actions that are needed to implement these projects in the next five (5) to 10 years.

1.0 Plans and Policies

The San Mateo County Comprehensive Bicycle Route Plan has been created through the diligent efforts of the City/County Association of Governments (C/CAG), the Bicycle and Pedestrian Advisory Committee, the individual cities and agencies, and citizens interested in improving the San Mateo County bicycling environment. Without the sustained efforts of these people, this Plan would not have been conceived and written.

1.1 Study Area

The primary study area of the Comprehensive Bicycle Route Plan (CBRP) includes the entire County and all connections into adjacent communities. The focus of the Plan is on a Primary (rather than local) Network of Bikeway corridors for inter-city and regional travel.

1.2 Relationship between this Plan and other Planning Efforts in San Mateo County

As an Element of the Countywide Transportation Plan, the Comprehensive Bicycle Route Plan is intended to coordinate and guide the provisions of all bicycle-related plans, programs, and projects within the County. As a Countywide Bicycle Plan, it focuses on providing bikeway connections between the incorporated cities, adjacent counties, and major regional destinations within the County. The plan also prioritizes recommended bikeway projects through the study area, and serves as a guide to the incorporated cities regarding bikeway policies and design standards.

Regional Bay Trail Plan

The Bay Trail is a planned multi-use trail that, when complete, will circle San Francisco and San Pablo bays along the shoreline, passing through 12 cities in San Mateo County. Local efforts to implement the Bay Trail are overseen by the Bay Trail Project, a nonprofit organization administered by the Association of Bay Area Governments. There are several developed segments of the Bay Trail in San Mateo; the longest one stretches from Bayfront Park in Millbrae to Redwood shores with only a few minor interruptions. There are also many gaps, the main ones being alone Highway 101 from San Francisco to the Brisbane Lagoon, around San Francisco International Airport (SFIA), and from San Carlos Airport to Menlo Park's Bayfront Park.

San Francisco International Airport Multi-Modal Transit Center and Bicycling Connections

The SFIA planning office is planning to provide a multi-modal transit center at the north-west portion of the airport parking lot at the corner of San Bruno Avenue and Airport Blvd. Secure bike parking will be provided along with a shuttle to carry passengers into the terminals. The multi-modal transit center will also connect to the Bay Trail. Bay Area Rapid Transit (BART) is extending its line into the City of Millbrae as well as into the SFIA terminal. The new Millbrae

station planned to be located at the south-west corner of the airport, at the intersection of Millbrae Avenue and Highway 101.

BART Extension

As part of the Millbrae BART extension, a multi-use trail is proposed along the BART right of way to the extent feasible. The feasibility of this project is currently being studied.

San Mateo County Bikeways Plan (1976)

The *San Mateo County Bikeways Plan* (1976), addresses issues of parking, education, recreational routes and commuter routes. The Plan outlines design standards and states a policy favoring the removal of parking where possible along proposed bike lane corridors where space is limited. Several funding sources are identified for the implementation of the proposed system. A detailed list of projects is proposed for each city, specifying specific streets, length of project and type of bikeway facility. As this Plan dates back to 1976, several of the projects have been built, however as noted in the Draft Countywide Transportation Plan (1995), many cities have developed bikeway systems independent of the County Bikeways Plan. Some of the Plan's top priority projects are summarized below:

North-South Corridors

1. El Camino Real - Bike Lanes
2. Alameda De Las Pulgas - Bike Lanes
3. Highway 1 – Path [1]
4. Skyline/Canada Roads - Combination of paths and lanes
5. Bayfront Route – Path

East-West Corridors

1. Higway 92 (with Crystal Springs and Laurelwood Canyons as Bayside feeders)
2. Sharp Park Road - Lanes
3. Edgewood Road – Route [2]
4. Woodside Road -Lanes
5. Alpine/Sandhill Road- Lanes

Countywide Transportation Plan, Existing Conditions Report (1995)

The bicycle chapter of the *Countywide Transportation Plan* (1995), provides a detailed analysis of countywide bicycle travel characteristics using the 1990 Census and 1991 national Transportation Survey. These characteristics include bicycle trip destinations, purposes, travel time and length as well as time of day and approximate number of daily riders by age group.

[1] Bicyclists will be allowed access to the planned Highway One Devil's Slide Tunnel.
[2] Edgewood Road does provide some bike lanes as of 1999.

The Plan identifies existing informal routes as well as approximate length of bike paths, lanes and official routes in the County, however it does not outline a recommended system. The Plan states that the existing bicycle system within the cities does not coincide with the San Mateo County Bikeways Plan (1976) due to uncoordinated planning efforts among the cities. The Plan also gives an overview of existing relevant plans, regulations and funding programs related to bikeway planning, however it does not make specific recommendations for new bikeway improvements.

San Mateo County Trails Plan

This recently adopted plan identifies a regional trail system in San Mateo County, including multi-use trails accommodating hikers, equestrians, and bicycles. There is some overlap in multi-use trails between the Comprehensive Bicycle Route Plan and Trails plan, although the Bicycle Plan focuses exclusively on paved trails.

San Mateo Countywide Transportation Plan (1999)

The City/County Association of Governments of San Mateo County (C/CAG) is in the process of updating the Countywide Transportation Plan. The draft Plan discusses general bicycling issues in the county and states a policy of "Developing and maintaining a bicycle transportation system that encourages the use of bicycles as a safe, efficient, and convenient alternative to the automobile." Recommendations from this Plan would be incorporated into that document.

Caltrain Multi-Use Trail Feasibility Study (1996)

SamTrans conducted a feasibility study of a multi-use trail along the Caltrain corridor through San Mateo County. The study, conducted by Callander Associates, focused on the physical availability of right-of-way along with constraints such as required setbacks, road crossing, embankments, and other factors. The study identified that a multi-use trail could be located along the Caltrain right-of-way from the tracks. Fencing, crossing upgrades, and other improvements were identified. The Plan was not adopted in part due to objections from some members of the bicycling community, who considered the route less desirable than El Camino Real or other on-street north-south routes.

San Mateo Bicycle Transportation Map

The *San Mateo Bicycle Transportation Map* was designed and developed by the City/County Association of Government. The routes identified on the map are based on the expertise of active bicycle commuters. The map identifies those routes with lower and higher traffic volumes.

The planning efforts of each City have been reviewed, consulted, and studied for consistency, and where appropriate, folded into the Comprehensive Bicycle Route Plan.

1.3 City Bikeways and Plans

While bicycling is allowed on all streets and roads except where expressly prohibited on freeways, local jurisdictions have developed bike plans and systems for focused improvements.

Town of Atherton
Population 7,475

The Town of Atherton is comprised primarily of low-density, residential development. There are no major highways through the City, with El Camino Real serving as its major thoroughfare. Several of the streets in Atherton are dead-end or form circuitous patterns, confining bicyclists to a few main roads that include Atherton Avenue, Marsh Road, Middlefield Road, Selby Lane and Alameda De Las Pulgas. There are approximately 4.7 miles of bike lanes, and one mile of officially signed bike routes in the city. To date, the City has no off-street bike paths.

City of Belmont
Population 25,900

Bordered by San Mateo on the north and San Carlos to the south, the City of Belmont is comprised of mainly low-density housing along with a mixture of level and hilly terrain. With the exception of El Camino Real, and Old County Road which carries high traffic volumes, many bike routes in the City are along steep grades. The main routes include Alameda De Las Pulgas, El Camino Real and Old County Road, in the north-south direction, and Ralston Avenue to the east-west. There are approximately 1.2 miles of Class I path, along the northern side of Water Dog Lake Park, a half mile of bike lanes (Ralston Avenue) and five miles of signed Class III routes (Hallmark Drive, Alameda De Las Pulgas and El Camino Real), in the City. Currently the City does not have a Bicycle Master Plan, however they are planning to build a bicycle/pedestrian bridge over Highway 101 at Ralston Avenue connecting to the Bay Trail, and a bicycle/pedestrian over-crossing over El Camino Real connecting to the Belmont/Caltrain station. Additionally, as part of a traffic study of Ralston Avenue, between El Camino Real and Alameda De Las Pulgas, the City is examining ways to provide various safety improvements, including combinations of traffic signals, roadway widening, and other streetscape modifications.

City of Brisbane
Population 3,310

The City of Brisbane is situated in the north-west corner of the county and is comprised of a mixture of residential and industrial land uses. The city is flanked by Highway 101 to the east and bisected by Bayshore Boulevard. The main through-county route is Bayshore Boulevard, which connects into both Daly City and South San Francisco, and Guadalupe Canyon Parkway, which ascends the San Bruno mountains into San Francisco. There are approximately 1.6 miles of Class I path looping around Sierra Point along the Bay, a half mile of bike lanes, and no official bike routes in the City.

City of Burlingame
Population 29,050

The City of Burlingame is a bayside city with several waterfront parks. Its borders extend from the San Francisco Bay to the hills near Skyline Blvd. Highway 101 runs along its eastern border connecting it to the Cities of Millbrae and San Mateo. There are two Caltrain stations in the city at Broadway and Burlingame Avenues. The City has not yet completed a Bicycle Master Plan. However, there is the Bay Trail along shoreline that is Class I facility, also there are two Class II bike lanes within the City; one along Skyline from Trousdale to the City Limit and the other along Airport Blvd. from Long Rd at Coyote Pt. to Fisherman's Park. The remaining bicycle facilities are signed Class III bike routes that for the most part correspond with the County Bicycle Transportation Map. The main north-south routes identified by the San Mateo Bicycle Transportation Map include Rollins Road, California Drive, and Cortez Avenue. Major east-west routes include Hillsdale Dr., Rosedale Ave. and Trousdale Dr. A Class I section of the Bay Trail also exists in Burlingame along the shoreline.

City of Colma
Population 1,200

Cemeteries make up the predominant land use in the City, with some low-density residential development. The City is bisected by El Camino Real and Hillside Boulevard and has one BART station. The City has not proposed any bike projects in any of its existing general or master plans. Primary existing routes for bicyclists identified by the San Mateo Bicycle Transportation Map are El Camino Real, Mission Road, Hillside Boulevard, and to a lesser extent, Junipero Serra Boulevard (due to high traffic volumes). The BART-SFO Bikeway project would provide a main bikeway segment in Colma upon completion.

City of Daly City
Population 103,400

Daly City is located just south of San Francisco on the west-side of the peninsula. The City is characterized by hilly terrain, and is flanked by Pacific beaches to the west and the City of Colma to the east. I-280 and the Skyline Boulevard bisect the City on each side of the hills. The City has not identified any proposed bicycle projects. The City does not currently have a Bicycle Master Plan, however they have an existing bikeways map. There several Class III bicycle routes through the City which serve as intra-county cycling routes including Skyline Blvd., Juniperro Serra Blvd., Eastmoor Avenue, John Daly Blvd, and Mission Street. There are bike lanes on a small portion of Skyline Blvd. as well as along Guadalupe Canyon Parkway which crosses through the San Bruno Mountain County Park and connects to Bayshore Blvd. The main bicycle routes currently used by bicyclists include John Daly Blvd. connecting to South Mayfair Ave., in the north-south direction, and Eastmoor Ave., in the east-west direction.

City of East Palo Alto
Population 25,450

East Palo Alto, located at the far south-east corner of the County on the Bay, is a small City cornered between Highway 84 and the Bayshore Highway. The high traffic volumes along Bayshore Road and Bayshore Freeway present significant barriers to bicyclists trying to access adjacent Cities. Bay Road, Pulgas Avenue and University Avenue (due to high traffic volumes) are the City's main bicycle corridors. Willow Road and University Ave. are the main thoroughfares connecting into Menlo Park and Palo Alto respectively. The Circulation Element of the City's General Plan (1998) addresses bikeway planning. The City has a well connected system of bike lanes and routes that join at the City's downtown area including lanes on primary streets such as University Avenue, E. Bayshore Rd. and Bay Rd. Additionally, a portion of the Bay Trail extends along the City's shoreline.

City of Foster City
Population 30,350 (1998 est.)

Foster City is a bayside city characterized by several lagoons and waterways and is bisected by Highway 92 leading to the San Mateo Bridge. Highway 101 runs parallel and just outside the City's western border. While there is no existing Bicycle Master Plan, the City has developed a comprehensive bike route system and a detailed map showing the bikeway system. The bikeway system primarily consists of bike routes that connect to several of the City's parks, shopping centers, and schools. A fully completed portion of the Bay Trail encircles the City that connects into the Cities of San Mateo and Burlingame. The Trail passes by the middle school offering a safer alternative for children bicycling to school. There is only a short segment of bike lanes within the City along Edgewater Boulevard, beginning at Beach Park Boulevard and continuing past the City boundary into the City of San Mateo.

City of Half Moon Bay
Population 11,550 (1998 est.)

Half Moon Bay is a growing ocean-side community located midway down the western side of the County. A local airport is located on the northern portion of the City. Highway 92 connects the city to I-280 and eastern side of the County. The predominant bike routes in the City are along Highways One and 92, although Highway 92 is steep, curving and has narrow shoulders. The City has developed a multi-use trail along the coastline and has plans and funding for several major extensions of the project, which will eventually extend from south of Half Moon Bay to Montara. The planned State Route 1 tunnel between Montara and Pacifica will provide access for bicycles. At completion, the existing Route 1 alignment through Devil's Slide will be opened for bicycle and foot travel exclusively, creating one of the premier bike path facilities in the country.

City of Hillsborough
Population 11,550 (1998 est)

Nestled below the eastern-side of San Mateo's mountains on hilly terrain, the City of Hillsborough is a low-density and primarily residential community. Due to the City's circuitous street patterns, there are few through-county routes. Most of these routes serve as east-west corridors and include Eucalyptus Drive, Black Mountain Road, Hayne Road and Crystal Springs Road. The County has examined the feasibility of adding bike lanes to Crystal Springs Road due to its importance as an east-west connector to the Sawyer Camp Trail and the proposed relocation of the Caltrain station in San Mateo closer to the eastern termination of Crystal Springs Road. Currently, the City of Hillsborough does not have a Bicycle Master Plan and has no existing official bike routes, lanes or paths.

City of Menlo Park
Population 31,258

Situated in close proximity to Stanford University, the City of Menlo Park had the highest share of bicycle commuting in the County according to the 1990 Census, with 4.5% of the commute mode share accounted for by bicycles. The City also has an extensive system of Class II bike lanes covering many of the City's street system. A Class I bike path exists along the western portion of the Bayfront Expressway that crosses over at Willow Rd. to continue on the east side of Highway 84 and onto the Dumbarton Bridge. Although, the city does not have separate Bicycle Master Plan, the Menlo Park General Plan addresses bicycle issues extensively. Within the General Plan, there is an existing bicycle related facilities map and a potential bicycle related facilities map. Additionally the General Plan sets forth a goal "to promote the safe use of bicycles as a commute alternative and for recreation," among other policies and implementation programs that work towards that goal.

City of Millbrae
Population 21,800

The City of Millbrae is bordered by San Francisco International Airport and Highway 101 on the east and I-280 on the west. There is one Caltrain station located in the lower south-western portion of the City. Most of the City's commercial development is concentrated along El Camino Real, Broadway, and around the Caltrain station. Currently, the City does not have a Bicycle Master Plan, however the Circulation Element of the City's General Plan briefly addresses goals and policies relating to bicycle planning, and includes specific projects such as the Bay Trail and continuation of the Spur Trail. City staff have also identified in a survey, priorities for bicycle improvements which include linking bike paths for commuters, developing a recreational multi-use trail system, and working with county agencies and jurisdictions to create a unified regional system of bike paths.

Primary existing east-west bike routes in the City include Millbrae Ave. Hillcrest, and Helen Drive. North-south routes include Magnolia, Ridgewood, although Ridgewood is a hilly street used mainly by avid bicyclists. Millbrae Ave. and El Camino Real serve as important connector streets to the Caltrain station. There are two Class I paths in the City. One segment of path exists along Bayfront Park at the east-side of Old Bayshore Highway. The second, known as the SPUR Trail, begins at Magnolia and Ashton in the south extending along Millbrae Ave. The City plans to extend this trail to connect to the Caltrain station, the future BART station, Taylor Elementary School, ultimately connecting into the Junipero Serra Regional Park in the northern border of the City. There is one bike route along Magnolia from the southern City Limit with Burlingame to Park Blvd. The City is also seeking funding to construct a multi-use trail along Skyline Boulevard from Larkspur to Hillcrest.

City of Pacifica
Population 40,400 (1998 est)

Pacifica, located south of Daly City, is an ocean-side community made of several distinct neighborhoods separated by mountainous terrain. Highway One runs through the community, linking it to Half Moon Bay, along which most of its commercial development as well as public facilities are concentrated. A large portion of the land area on the eastern side of the City is parkland and dedicated to the Golden Gate National Recreation Area. The existing bikeway system primarily consists of a bicycle route along Highway One. A map received from the City indicates that there are proposed improvements concentrated primarily along this corridor. The City is undertaking a Bicycle Master Plan Update as of October 1999.

Town of Portola Valley
Population 4,550 (1998 est)

Portola Valley is a very small, low-density residential, community located south of Stanford University. Much of the western edge of the City is comprised of open space preserve. There are no highways through the City with Portola and Alpine Roads serving as major thoroughfares and bicycle routes through the City. There are approximately 2.2 miles of Class I bike paths, 6.8 miles of bike routes with shoulders.

City of Redwood City
Population 75,200 (1998 est)

Redwood City is a large city that extends from I-280 to the edges of the Bay and is bisected by Highway 101. The Redwood Shores Ecological Area is located on Bair Island at the City's Bay-side border. There is one Caltrain station in the City. Major bicycle routes through the City include Alameda De Las Pulgas and Hudson Ave. to the north-south, Farm Hill Blvd., and Jefferson and Whipple Avenues running east-west. There are approximately 4.3 miles of bicycle paths, 6.2 miles of bike lanes, and 4.1 miles of bicycle routes in the City. The City has a Bikeways map showing bike lanes, paths and routes, including existing facilities on Alameda de las Pulgas and Seaport Boulevard.

City of San Bruno
Population 41,450 (1998 est)

The City of San Bruno is located directly adjacent to the San Francisco International Airport. It is also bisected by U.S. 101, I-380, I-280, the Caltrain tracks, and (in the future) BART. The City has a lively and compact downtown area, centered on El Camino Real and San Mateo Avenue. Primary bicycle routes identified in the San Mateo Bicycle Transportation Map include Sneath Lane, San Mateo Avenue and Crystal Springs Avenue. There is only a small segment of bike lanes in the City, no bike paths and approximately 5.1 miles of official bike routes.

City of San Carlos
Population 28,550 (1998 est)

The City of San Carlos is a medium sized community located just north of Redwood City and south of Belmont. The City's street system is a mixture of hilly terrain with circuitous patterns and a flat terrain with linear grid patterns. There is some light-industrial land use at the City's eastern border near Highway 101. The City does not have a Bicycle Master Plan. Main bicycle routes include Old County Road, San Carlos Ave, Elm Street and Brittan Ave. There are approximately 10.7 miles of signed bike routes throughout the City, however there are no bike lanes or bike paths to date.

City of San Mateo
Population 93,600 (1998 est)

The City of San Mateo, one of the larger cities in the County, is bisected by Highways 92 and 101. The City holds several major attractions and destinations including the College of San Mateo, and the Bay Meadows Race Track. Most of the street system is on level terrain with a regular grid pattern. The City's bikeway system consists mainly of bicycle routes, some bike lanes near the downtown area, and a portion of the Bay Trail along its waterfront at Coyote Point as well as a multi-use path along Sawyer Camp Road. Primary bicycling routes in the City include Old County Road, Alameda De Las Pulgas and San Mateo Drive in the north-south direction. Crystal Springs Road, Hillsdale and Ralston Drive, form the Cities primary east-west routes. The City has a bicycle master plan within the Circulation Element of their 1990 general plan The plan addresses general policies and issues related to bicycling and contains a map showing existing and proposed bikeways. Proposed bikeways consists primarily of bicycle routes along residential streets.

City of South San Francisco
Population 59,200 (1998 est)

Located at the northern end of San Mateo County, South San Francisco is composed of a mixture of warehousing, high tech and bio-engineering firms, and older residential areas. The City is bisected by the Bayshore Highway and the Caltrain commuter railroad corridor. The current bicycling pattern consists of bicycle commuters heading northward towards Brisbane and downtown San Francisco, or northwest along the El Camino Real towards Daly City and San Francisco State University. The City does not have a bicycle master plan however the South San Francisco General Plan: Existing Conditions and Planning Issues (1997) briefly addresses bicycling issues and provides a map of existing and proposed bicycling facilities. The existing bikeway system is composed of about 11 miles of Class II bike lanes and a short piece of Bay Trail. A class I multi-use trail along the BART–SFO alignment and new pathways in the industrial area east of U.S. 101 is currently being studied.

Town of Woodside
Population 5,625 (1998 est.)

The town of Woodside is a small, rural community with several adjacent open space reserves. Bisected by I-280, the primary thoroughfares and bicycle routes include Highway 84 (Woodside Rd. – La Honda Rd.), Whisky Hill Rd., Canada Road, Kings Mountain Road, and Mountain Home Road. The town has over 6 miles of bike lanes and approximately 24 miles official bike routes. There are no-off-street multi-use trails.

Table 1summarizes the existence of bike planning documents among the Cities.

Table 1

Existing Bicycle Planning Documents by City

City	Bicycle or Trails Master Plan	Year Adopted	Bicycle Coordinator
Atherton	No	-	No
Belmont	No	-	Yes
Brisbane	Yes	1992	No
Burlingame	No	-	No
Colma	No	-	No
Daly City	No	-	No
East Palo Alto	Yes (within GP)	1998	No
Foster City	No	-	No
Half Moon Bay	Yes	1992	Yes
Hillsborough	No	-	No
Menlo Park	Yes (within GP)	1994	Yes
Millbrae	No	-	Yes
Pacifica	(underway)	-	No
Portola Valley	Yes	1970/1997	No
Redwood City	No material received		
San Bruno	No material received		
San Carlos	No	-	No
San Mateo	Yes (within GP)	1990	Yes
South San Francisco	Yes (within GP)	1986	No
Woodside	Yes	1997	Yes

1.4 Goals of the Comprehensive Bicycle Route Plan

Goals provide the context for the specific policies and recommendations discussed in the Comprehensive Bicycle Route Plan. The goals provide the long-term vision and serve as the foundation of the plan. The goals are broad statements of purpose that do not provide details, but show the Plan's direction and give overall guidance. Objectives provide more specific descriptions of the goal, while policy actions provide a bridge between general goals and actual implementation guidelines, which are provided in the Implementation chapters.

The following Goals and Objectives are intended to guide bicycle planning, design, and implementation. Note that each policy action that is addressed in this Plan is noted with a [P].

Objective 1.0 Planning

Plan for the development of bicycle facilities and programs as a viable alternative to the automobile.

Policy 1.0 Develop a process to plan, design, implement, and maintain bicycle infrastructure in San Mateo County.

Actions:

1.1 Develop and adopt a Comprehensive Bicycle Route Plan which identifies existing and future needs, and provides specific recommendations for facilities and programs over the next 20 years.[P]

1.2 Update this Plan on a regular basis (consistent with Caltrans/General Plan standards) as required by funding agencies, which is typically every two years. [P]

1.3 Ensure that the Plan is consistent with all existing County, regional, state, and federal policy documents, including all General Plan elements.[P]

1.4 Encourage development concepts (such as mixed use projects) that have as a goal the reduction of the dependency on the automobile for short commute, shopping, and recreational trips.

1.5 Maximize coordination between Cities in the County and neighboring jurisdictions by establishing points of contact within each agency (which may be a bicycle coordinator) for bicycle projects and protocol for reviewing plans.[P]

Objective 2.0 Community Involvement

Involve the Community in the Planning and Implementation of the Bicycle System.

Policy 2.0 Encourage public participation through local coordination with County staff.

Actions:

2.1 Discuss the need, role, responsibility, cost, and funding of local bicycle coordinators whose responsibility would be to (a) provide support to the public, (b) act as a liaison to the other agencies, (c) act as a liaison to local bicyclists, the media, and the community in

general, (d) review and/or complete funding applications, (e) provide inter-departmental coordination, and (f) develop proposals and programs.[P]

2.2 Public involvement in the planning process should be maximized through workshops, surveys and other means.[P]

2.3 Build coalitions with businesses and other organizations the bicycle system serves as well as local clubs and organizations.[P]

2.4 Continue the county Bicycle Pedestrian Advisory Committee (BPAC) to provide continuous input and support for bicycle facility and bikeway plan developments and revisions.

Objective 3.0 Opportunities

Utilize existing resources in San Mateo County.

Policy 3.0 Build upon the existing bikeway system and programs in San Mateo County.

Actions:

3.1 Identify existing and proposed bike paths, lanes, and routes, sidewalks, walkways, and develop a county-wide system to maximize use to the extent feasible.[P]

3.2 Identify deficiencies, gaps, or areas that need improvement.

3.3 Explore the feasibility of multi-use pathways (bike paths) along existing corridors such as utility and railroad right-of-ways, and waterways and shorelines, including completion of the Bay Trail. [P]

3.4 Identify existing bicycle education programs and target future expansion as need warrants.[P]

Objective 4.0: Facility Design

Provide high quality and safe opportunities for all people in San Mateo County to bike to work, school, or play.

Policy 4.0 Develop a countywide bicycle system that meets the needs of commuter and recreational users, helps reduce vehicle trips, and links residential neighborhoods with local and regional destinations.

Actions:

4.1 Develop a primary commuter system which provides direct routes between residential neighborhoods and regional employment centers, commercial centers, transit stops, and schools.[P]

4.2 Develop a primary recreational system which uses lower traffic volume streets, off-street multi-use paths, and serves regional historic and natural destinations as well as community facilities.[P]

4.3 Develop a series of planning and design guidelines and standards from Caltrans, AASHTO, and other sources related to implementing bikeways, for use by local agencies.[P]

4.4 Develop a primary bicycle network that balances the need for directness with concerns for safety and user convenience. Where needed, develop a dual system which serves both the experienced and inexperienced bicyclist, and helps to separate bicyclists from other recreational users.[P]

4.5 Ensure that all new transportation projects in the County consider the needs of bicyclists and incorporate bicycle facilities in the planning and design process, including the routes and designs covered in this Plan and local bike plans.[P]

4.6 In order to encourage cycling throughout the county, the cities should consider developing criteria for installing traffic calming devices. These devices may include; traffic roundabouts, channelization, neck-downs, T-intersections, modified designs for travel lanes, and reduction in street widths where significant through traffic impacts low density residential areas. These devices should only be installed where desired by residents, impacted businesses, and where a demonstrated need exists and where they are compatible with the access needs of emergency vehicles. Installation design and priority should consider equity between different neighborhoods.

4.7 Encourage the adoption of specific zoning requirements for the provision of bicycle parking in new developments and major re-developments.

Objective 5.0: Multi-Modal Integration

Integrate Bicycle Mode into other Alternative Modes

Policy 5.0 Maximize multi-modal connections to the bicycle system.

Actions:

5.1 Ensure that the primary countywide system is integrated into existing transit stops and services in San Mateo County.[P]

5.2 Work with local and regional transit agencies to install bike lockers and racks where possible, and to maintain bike racks on buses.[P]

5.3 Work with Caltrain and BART to ensure adequate bicycle access to stations, adequate bicycle parking at stations, and adequate capacity for bicycles on the trains themselves.

Objective 6.0 Safety and Education

Maximize bicycle safety in San Mateo County.

Policy 6.0 Improve bicycle safety conditions in San Mateo County.

Actions:

6.1 Monitor bicycle-related accident levels regularly, and target a 40 - 50% reduction on a per capita basis over the next twenty (20) years.[P]

6.2 Develop a comprehensive bicycle education and safety program that is taught to all school children in the County.[P]

6.3 Develop a system for identifying, evaluating, reporting and funding maintenance of paths, lanes and signage and responding to safety problems on the existing bikeway system.[P]

6.4 Incorporate bicycle safety curriculum into existing motorist education and training.[P]

6.5 Coordinate with the County Sheriff Department and local police departments to determine strategies of education and enforcement.[P]

6.6 Recommend the use of local police bike patrol units to monitor bikeways and enforce bicycle-related laws and educate the community on safe and proper bicycle use.

Objective 7.0 Phasing

Target Improvements for those Areas with the Highest Need and Benefit

Policy 7.0 Develop detailed and ranked improvements in the Comprehensive Bicycle Route Plan.

Actions:

7.1 Identify the top bicycle improvements to be completed in the short to mid term (Primary System) based on a variety of objective and subjective criteria, including number of activity centers served, closure of critical gaps, immediate safety concerns, existing bicycle use, and input from the public and staff.[P]

7.2 Develop detailed implementation information on each recommended segment, including length, classification, adjacent traffic volumes and speeds, environmental impact, activity centers served, cost, and overall feasibility.[P]

7.3 Develop prototype cross sections and plans for the design of bikeways facilities that meet state and federal standards.[P]

7.4 Complete needed design and feasibility work on all proposed bicycle facilities in order to determine the accurate cost and other implementation information.

7.5 Develop education and maintenance programs which may be adopted by local jurisdictions.[P]

Objective 8.0 Support Facilities and Programs

Maximize bicycling as a transportation mode in San Mateo County.

Policy 8.0 Develop a coordinated strategy to develop support facilities and programs in San Mateo County.

Actions:

8.1 Develop and update a bikeway map for public agency use that shows existing and recommended bicycle routes.[P]

8.2 Sponsor annual bicycle events such as Bike to Work Day and adult safety courses in conjunction with regional efforts.[P]

8.3 Promote use of bicycles as a safe and convenient alternative mode of transportation.[P]

8.4 Develop a unique and distinctive logo for the San Mateo County Bikeway System to be located on the countywide system along with appropriate directional and warning signs. Improve existing and future countywide bicycle signage.

8.5 Implement a bicycle rack program in commercial districts and at public facilities.

Objective 9.0 Funding

Maximize the amount of funding to implement the proposed bicycle system within a prudent budgetary plan.

Policy 9.0 Maximize the amount of state and federal funding for bicycle improvements that can be received by San Mateo County.

Actions:

9.1 Identify current regional, state, and federal funding programs, along with specific funding requirements and deadlines.[P]

9.2 Encourage multi-jurisdictional funding applications.[P]

9.3 Develop a prioritized list of improvements along with detailed cost estimates, and identify appropriate funding sources for each proposal.[P]

9.4 Include bicycle improvements in the County's Capital Improvement Plans.

9.5 Encourage the adoption of mitigation standards and requirements for all major residential and community commercial development projects to provide bike improvements or a contribution into a transportation improvement fund.[P]

9.6 Encourage private and corporate donations and grants that may be used to support bicycle facilities and programs.

Objective 10.0 Implementation and Maintenance

Implement the Proposed Bicycle System

Policy 10.0 Anticipate impacts of future developments along existing and proposed bicycle improvements.

Actions:

10.1 Encourage review development projects for consistency with the recommendations in this Plan and local bikeway plans, and require dedication of land and development of project when feasible. Encourage development of the Bay Trail along the waterfront to provide for public access as required by Bay Conservation Development Commission (BCDC) and the San Francisco Bay Trail (Bay Trail). [P]

10.2 Develop policies for new developments which ensure that bicycle user□s needs are incorporated into new neighborhoods and with new/modified roadways, including providing access points to existing and proposed bicycle facilities, on-street bicycle facilities for bicyclists, and proper roadway crossings where new streets will cross existing and proposed bikeways.[P]

10.3 Encourage Caltrans to provide bicycle crossings along all state highways, and especially at key interchanges where traffic speed and congestion poses a major barrier for bicyclists.[P]

10.4 Consider requirements to have new developments to provide bicycle facilities as designated in this Plan.

2.0 Existing Conditions

2.1 Definition of Bikeways

Bikeways are described by Caltrans in Chapter 1000 of the Highway Design Manual as being one of three basic types (see Figure 1 on the next page).

- **Class I Bikeway** Variously called a bike path or multi-use trail. Provides for bicycle travel on a paved right of way completely separated from any street or highway. By definition, multi-use trails are also used by pedestrians, rollerbladers, and other user groups.

- **Class II Bikeway** Referred to as a bike lane. Provides a striped lane for one-way travel on a street or highway.

- **Class III Bikeway** Referred to as a bike route. Provides for shared use with motor vehicle traffic and is identified only by signing. Class III bike routes can also include streets and roads with shoulder striping or fog lines, but that do not meet the criteria for a Class II bike lane.

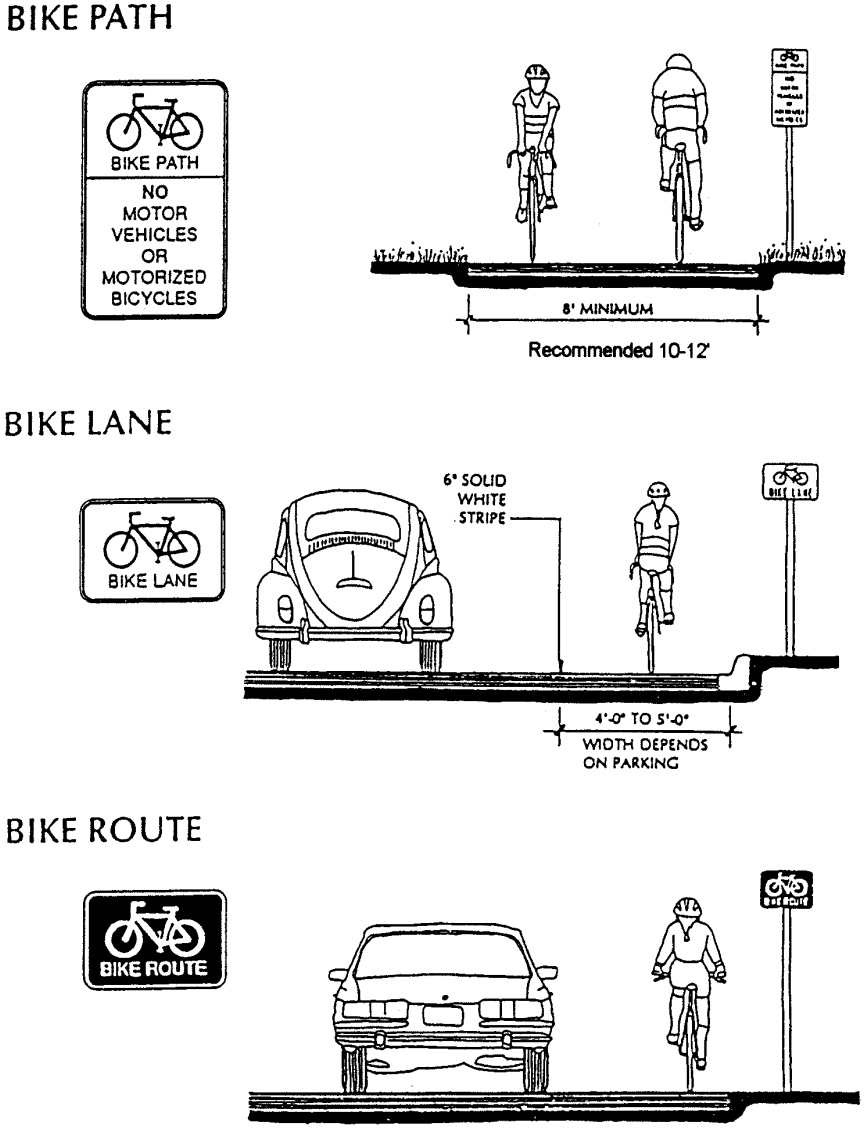

Figure 1: **Class I Bike Path, Class II Bike Lane, Class III Bike Route**

2.2 Existing Bikeways

The existing bikeway system has been influenced and shaped in part by its unique topography. The County is bisected by the coastal mountain ranges that form a division between the western and eastern side the peninsula. Historically, each City developed its street grid system focusing on the downtown and local railroad stations, resulting in a discontinuous street grid system from community to community. The mountain ranges as well as several major north-west arterials and freeways such as Highway 101, El Camino Real, and I-280, inhibit fluid east-west bicycle travel. Conversely, the mountain ranges and abundance of open space parks and reserves throughout the western portion of the County offer challenging and exciting bike rides to the avid recreational bicyclist. Table 2 summarizes the existing bikeway facilities throughout the County.

Table 2

Existing Bicycle Facilities in San Mateo County (miles)

City	Path (Class I)	Lane (Class II)	Route (Class III)
Atherton	0.0	4.7	0.9
Belmont	1.2	0.4	5.1
Brisbane	1.6	0.5	0.0
Burlingame	4.2	0.0	9.2
Colma	0.0	0.0	0.0
Daly City	0.5	3.3	13.3
East Palo Alto	0.0	0.0	4.2
Foster City	10.6	0.7	15.1
Half Moon Bay	4.5	3.0	7.0
Hillsborough	0.0	0.0	0.0
Menlo Park	2.6	10.4	0.2
Millbrae	1.2	0.0	2.0
Pacifica	0.3	1.2	3.8
Portola Valley	2.2	0.0	6.8
Redwood City	4.3	6.2	4.1
San Carlos	0.0	0.0	10.7
San Bruno	0.0	0.1	5.1
San Mateo	6.7	10.3	13.0
South San Francisco	2.0	11.2	18.7
Woodside	0.0	6.4	23.9
Unincorporated	*6.4*	*14.6*	*13.0*
Total	**48.3**	**73**	**156.1**

Source: San Mateo Countywide Transportation Plan, Existing Conditions Report, 1995

There are several major multi-use trails throughout the County. Part of the Bay Trail, known as the Bay Trail Loop, arches around the edges of Foster City and San Mateo. There is a break in the trail, however, at the inlet and south end of San Mateo that picks up again along the Bay Front expressway south of Redwood City. Burlingame is home to an additional segment of the Bay Trail that runs along the shoreline. Another path, known as the Sawyer Camp Trail, runs along San Andreas Lake and Lower Crystal Springs Reservoir at the eastern foothills of the coastal mountains.

Currently, the County does not have an extensive or well connected system of bike lanes and most cities have a system that is comprised primarily of disconnected Class II bike lane and Class III bike route segments. The Cities of Menlo Park and Foster City have the most extensive network of bike lanes and paths.

Multi-use trails on the Dumbarton Bridge, which spans the southernmost portion of the Bay, allow bicyclists to reach destinations in the East Bay. A bike shuttle is currently planned for the San Mateo-Hayward Bridge.

Gaps in the existing bikeway system does not mean that people are not riding. The bicycling community--ranging from experienced club riders to school children--has developed its own system of streets and routes that provide connectivity and safety for their purposes. Key observations on existing bicycling conditions include: Both the Dumbarton and San Mateo – Hayward Bridges are part of the San Francisco Bay Trail system.

- There are a wide variety of bicycling environments ranging from hilly, open and mountainous, to quiet, easy, residential to urban and dense with high traffic volumes.

- El Camino Real is a heavily trafficked corridor, and as such is difficult for use as a north-south route for bicyclists of moderate to low expertise.

- Circuitous residential street patterns in many of the cities make direct north-south travel along alternative routes to El Camino Real difficult.

- Many streets lack the proper signage needed to direct bicyclists along the bikeway routes through the County. Additionally, signage alerting motorists to cyclists and encouraging them to share the road is lacking.

- There are several secondary streets that can potentially serve as alternatives to El Camino Real along the north-south County-corridor.

- Many of the east-west routes are through steep terrain, along sharply curving roadways with narrow shoulder widths and may deter some cyclists.

- Most Cities have not yet prepared Bicycle Master Plans or developed comprehensive systems of bike lanes and multi-use trails.

- There is generally a shortage of safe and appropriately located bicycle parking facilities at commercial areas and schools.

- There is a general lack of bike lanes and connectivity between bike lanes in many of the cities within the County.

- Access to BART and Caltrain stations is difficult due to high traffic volumes along arterials leading to the stations.

- Bike storage onboard Caltrain is insufficient.

- Several of the major bicycling corridors consist of wide shoulders with striping but do have stenciling identifying it as an official bicycle lane. These shoulders have often been neglected in street resurfacing projects.

- Gaps in the Bay Trail along the shoreline in Burlingame are caused by a lack of bridges. Currently, users cross channels at low tide where there are no existing bridges.

- Freeway on/off ramps (such as the I-280 & Highway 1 interchange at Skyline Blvd) along current cycling routes encourage motor vehicles to enter and exit freeways at high speeds while merging across bike lanes or shoulders and pose extremes hazards to cyclists.

Existing bicycle facilities and major activity centers in and around San Mateo County are shown in Figure 2 on page 48.

2.3 Relevant Legislation and Policies

Caltrans and the Metropolitan Transportation Commission play an oversight and review role for federal funding programs for bicycle projects. The Transportation Equity Act of the 21st Century (TEA-21), a replacement program for the Intermodal Surface Transportation Equity Act (ISTEA), provides many of the same programs oriented to bicycles as did ISTEA-- with more money being available. Many of these bicycle funding programs require approval of a Bicycle Master Plan with specified elements in order to qualify for the program. On a state level, according to the California Bicycle Transportation Act (1994), all cities and counties should have an adopted bicycle master plan that contains:

- Estimated number of existing and future bicycle commuters (see Section 3.1)

- Land use and population density (see Section 3.1, and appendix)

- Existing and proposed bikeways (see figures 2-7)

- Existing and proposed bicycle parking facilities (see Sections 2.5, & 4.4)

- Existing and proposed multi-modal connections (see Sections 3.2 & 4.5)
- Existing and proposed facilities for changing and storing clothes and equipment (see Section 4.4)
- Bicycle safety and education programs (see Section 3.2 & 4.5)
- Citizen and community participation (see Sections 3.0 & 4.2)
- Consistency with transportation, air quality, and energy plans (see Sections 1.2 & 1.3)
- Project descriptions and priority listings (see Sections 4.3, and Tables 12-13)
- Past expenditures and future financial needs (see Section 6.0)

In addition to these required elements, the ***Caltrans Highway Design Manual*** contains specific design guidelines that must be adhered to in California. Chapter 1000: Bikeway Planning and Design of the Manual sets the basic design parameters of on-street and off-street bicycle facilities, including mandatory design requirements. On a regional level, both the Metropolitan Transportation Commission (MTC) and Bay Area Air Quality Management District (BAAQMD) serve as a review and funding approval role on some bikeway projects.

2.4 Bicycle Parking

Bicycle parking includes bike racks, lockers, and corrals. Racks are low cost devices that typically hold about 2-4 bicycles, allow bicyclists to securely lock their frames and wheels, are secured to the ground, and are located in highly visible areas. Bike lockers are covered storage units that typically accommodate two bicycles per locker (each with its own door and lock), and provide additional security and protection from the elements. Bike lockers are most often found in commercial areas where regular commuters can take advantage of the multi-modal connections and feel safe in leaving their bicycles. Bike corrals can be found at schools, stadiums, special events, and other locations, and typically involve a movable fencing system that can safely store numerous bicycles. Security is provided by either locking the enclosure or locating it near other activities so that it can be supervised.

A field review of San Mateo County revealed the existence of bike racks for bicyclists at parks, schools, and a few locations in commercial areas. Bicycle racks and lockers are provided at most Caltrain and BART stations. Each Caltrain station has from one to three bike racks, or parking for six to twenty bikes. As of April 1999, there were a total of 726 bike lockers at all Caltrain stations, with an average of 38 lockers per station. There is a wait list to receive a locker for two of the stations, one at 4th and King in San Francisco and the other at the California Street station in San Mateo County.

Otherwise, bicyclists visiting stores, restaurants, places of employment, and community facilities are largely left to their own devices to temporarily store their bicycles. The lack of secure

parking has become a major consideration in San Mateo County and around the country, the result of the increased value of bicycles and relative ease of theft. Most bicycles today range in value from $350 to over $2,000. Bicycles are one of the top stolen items in all communities, with components being stolen even when a bicycle is securely locked. Specific recommendations on the bicycle storage type, amount, location, and other details are provided in the ensuing chapters.

2.5 Multi-Modal Connections

Existing multi-modal connections for bicyclists include connections to the SamTrans bus system, Caltrain stations as well as connections to San Francisco and the Bay Area via BART. SamTrans provides bus service through the entire County, forming connections to BART, Caltrain as well as Muni stations in San Francisco. All SamTrans buses carry up to four bicycles, including two on the front-mounted bike racks and two on board the bus. Caltrain stations provide connections for bicyclists to a majority of San Mateo Cities along the eastern side of the peninsula, as well as employment centers in San Francisco and Santa Clara Counties. Additionally, Caltrain stations provide connections to several popular recreational riding destinations including the San Mateo-Foster City Bike/Pedway Path leading to the Bay Loop, and Shorline Park in Mountain View. Each Caltrain train has a car with space for 24 bikes, with some commute trains having a second car, which doubles capacity to 48 bikes. Bicycles must be stowed in a designated bicycle storage area located typically in the northern-most car of the train. Additionally, many stations provide rental lockers for bicycle storage as mentioned previously. Bicycles are allowed on BART trains except in the commute directions during commute hours.

3.0 Needs Analysis

Four public workshops were held in San Mateo County on June 8, June 15, September 29, and October 7, 1999, with the purpose of identifying bicycling needs. Attendees were asked to comment verbally and on surveys. They were also asked to show on large-scale maps of the County their current riding habits and views on bicycling opportunities and constraints in San Mateo County. Results of the surveys, workshop and subsequent correspondence and field review are presented below. Additionally over 1000 surveys were distributed to bicycle shops, schools, the Sawyer Creek and Bicycle Sunday Trail Heads, as well as various Transportation Management Agencies throughout the County. As of November 1999, over 300 surveys had been collected and tabulated.

Bicycle Survey Results

Number of Responses	Number of Responses		
1. Preference for on street vs. off-street facilities:			
	On-Street		52%
	Off-street		39%
	Both		9%
			100%
2. Bicycle Ownership			
	0 bicycles		.01%
		1	41.6%
		2	36.1%
		3	22.2%
			100.0%
2. Type of Bicycle			
	BMX/Mtn. Bike		48%
	Road		39.9%
	Cruiser		12.1%
			100.0%
3. Bicycling levels:			
	1x or more per day		20.8%
	1-6x/week		56.9%
	1-3x/month		18.1%
	Very rarely		4.2%
	Never		0%
			100%
4. Trip Purpose:			
	Recreation		60%
	Shopping		13%
	Work Commute		23%
	School		4%
			100%

5. Number One Reason why you don't ride more often:

no reason	8.4%
Safety	34.7%
lack of places to ride	20.8%
lack of storage	6.9%
weather/darkness	20.8%
need access to car	8.4%
	100%

6. Top 5 Priority Improvements:

Bike Lanes on El Camino Real	12%
Driver Education	8%
More Bike Lanes	8%
Parrallel Bike Path along Caltrain	8%
More Signage (share-the-road, directional, watch for bikes)	7%
Improve (smooth and widen) road shoulders when road work is done	6%
Access to BART/SamTrans/Caltrain	6%
Law enforcement of bike laws	5%
More bike parking commercial areas & downtowns	5%
Extend Bay Trail	3%
Woodside Road (more bike lanes)	3%
Widen Skyline (add bike lane)	3%
Improve safety of freeway on/off ramps and interchanges for bikes	2%
Open Bear Gulch to Bikes	2%
More bike parking at Caltrain stations	2%
Improve Sandhill & Alpine crossing	2%
Better Connectivity of Bike Lanes	1%
Safe Access to SFO	1%
Bike Access to San Mateo Bridge	1%
Bike Lanes on Alameda De Las Pulgas	1%
Bike paths to parks	1%
More bike commuter incentive programs	1%
Improve Canada & 92	1%
Improve Crystal Springs Rd	1%
Better paths on Los Trancos	1%
Better paths on Arstradero	1%
Hillsdale overpass	1%
Improve I-280	1%
Improve shoulders/bike lanes on Middlefield	1%
Increase bike capacity on Caltrain	1%
	100%

7. Popular Routes

Canada Rd.	9%
Alameda De Las Pulgas	6%
Bay Trail	5%
Skyline	4%
Portal Avenue	4%
Alpine Rd.	4%
La Honda	4%
Ralston	4%
Industrial	3%
Edgewood	3%
N. Delaware	3%
Crystal Springs	3%
Hillcrest Avenue	3%
Kings Mountain Rd.	3%
Sand Hill	3%
Woodside Raod	2%
Bayswater	2%
Bayshore Blvd.	2%
Hwy One	2%
Barrolihet	1%
Other (various streets throughout county)	29%
	100%

These results plus many individual comments represent a summary and sample of opportunities and constraints in San Mateo County and have been used to help create a bicycle system and program.

In concert with the goals of bicycle planning, reviewing the needs of bicyclists can be useful in pursuing competitive funding and attempting to quantify future usage and benefits to justify expenditures of resources.

3.1 Commuter and Recreational Bicycle Needs

The purpose of reviewing the needs of recreational and commuter bicyclists is twofold: (a) it is instrumental when planning a system which must serve both user groups and (b) it is useful when pursuing competitive funding and attempting to quantify future usage and benefits to justify expenditures of resources. According to a May 1991 Lou Harris Poll, it was reported that *"...nearly 3 million adults--about one in 60--already commute by bike. This number could rise to 35 million if more bicycle friendly transportation systems existed."* In short, there is a large reservoir of potential bicyclists in San Mateo County who don't ride (or ride more often) simply because they do not feel comfortable using the existing street system and/or don't have appropriate bicycle facilities at their destination.

Key general observations about bicycling needs in San Mateo County include:

- **Bicyclists are typically separated between experienced and casual riders.** The U.S. Department of Transportation identifies thresholds of traffic volumes, speeds, and curb lanes where less experienced bicyclists begin to feel uncomfortable. For example, on an arterial with traffic moving between 30 and 40 miles per hour, less experienced bicyclists require bike lanes while more experienced bicyclists require a 14 or 15 foot wide curb lane.

- **Casual riders include those who feel less comfortable negotiating traffic.** Others such as children and the elderly may have difficulty gauging traffic, responding to changing conditions, or moving rapidly enough to clear intersections. Other bicyclists, experienced or not, may be willing to sacrifice time by avoiding heavily traveled arterials and using quieter side streets. In some cases, casual riders may perceive side streets (or sidewalks) as being safer alternatives than major through routes, when in fact they may be less safe. Other attributes of the casual bicyclist include shorter distances than the experienced rider and unfamiliarity with many of the rules of the road.

  The casual bicyclist will benefit from route markers, bike lanes, wide curb lanes, and educational programs. Casual bicyclists may also benefit from marked routes that lead to parks, museums, historic districts, and other visitor destinations.

- **Experienced bicyclists include those who prefer the most direct, through route between origin and destination, and a preference for riding within or near the travel lanes.** Experienced bicyclists negotiate streets in much the same manner as motor vehicles, merging across traffic to make left turns, and avoiding bike lanes and shoulders that contain gravel and glass. The experienced bicyclist will benefit from wide curb lanes and loop detectors at signals. The experienced bicyclist who is primarily interested in exercise will benefit from loop routes which lead back to the point of origin.

- **Bicycles themselves range in cost from about $350 to over $2,000 for adult models.** The most popular bicycle type today is the hybrid mountain bike or BMX. These relatively light weight bicycles feature wider knobby tires that can handle both on-road and off-road conditions, from 10 to 27 gears, and up-right handlebars. Advanced versions have features such as front and rear shocks to help steady the rider on rough terrain. The 10-speeds of years past has evolved into a sophisticated ultra-light ‘road bicycle’ that is used primarily by the serious long distance adult bicyclists. These expensive machines feature very narrow tires that are more susceptible to flats and blow-outs from debris on the roadway.

- **Who rides bicycles?** While the majority of Americans (and San Mateo County residents) own bicycles, most of these people are recreational riders who ride relatively infrequently. School children between the ages of about 7 and 12 make up a large percentage of the bicycle riders today, often riding to school, parks, or other local destinations on a daily basis weather permitting. The serious adult road bicyclist who

may compete in races, 'centuries' (100 mile tours) and/or ride for exercise makes up a small but important segment of bikeway users, along with serious off-road mountain bicyclists who enjoy riding on trails and dirt roads. The single biggest adult group of bicyclists in San Mateo County is the intermittent recreational rider who generally prefers to ride on pathways or quiet side streets.

3.1.1 Bicycle Commuter Needs and Benefits

Bicycle Commuter Needs

Commuter bicyclists in San Mateo County range from employees who ride to work to a child who rides to school. Bicycling requires shorter commutes, which runs counter to most land use and transportation policies that encourage people to live farther and farther from where they work. Access to transit helps extend the commute range of cyclists, but transit systems also face an increasingly dispersed live-work pattern that is difficult to serve. Despite these facts, San Mateo County has a great potential to increase the number of people who ride to work or school because of (a) the presence of inter-modal transit connections (Caltrain, BART and SamTrans) that allow bicycles on board thereby extending viable commute distances for the average rider, (b) moderate density residential neighborhoods with quiet side streets leading to commercial and employment centers (c) a mild climate that is favorable throughout most of the year, and (d) the continual development of the Bay Trail which provides safe access to several employment centers.

Key bicycle commuter needs in San Mateo County are summarized below.

- Commuter bicyclists typically fall into one of two categories: (1) adult employees, and (2) younger students (typically ages 7-15).
- Commuter trips range from several blocks to 1 or more miles.
- Commuters typically seek the most direct and fastest route available, with regular adult commuters often preferring to ride on arterials rather than side streets.
- Commute periods typically coincide with peak traffic volumes and congestion, increasing the exposure to potential conflicts with vehicles.
- Places to safely store bicycles is of paramount importance to all bicycle commuters.
- Major commuter concerns include changes in weather (rain), riding in darkness, personal safety and security.
- Rather than be directed to side streets, most commuting adult cyclists would prefer to be given bike lanes or wider curb lanes on direct routes.

- Unprotected crosswalks and intersections (no stop sign or signal control) in general are the primary concerns of all bicycle commuters.

- Commuters generally prefer routes where they are required to stop as few times as possible, thereby minimizing delay.

- Many younger students (ages 7-11) use sidewalks for riding to schools or parks, which is legal in many areas, often where pedestrian volumes are low and driveway visibility is high. Where on-street parking and/or landscaping obscures visibility, sidewalk riders may be exposed to a higher incidence of accidents. Students 12 years or older who consistently ride at speeds over 5 mph should be directed to riding on-street wherever possible.

- Students riding the wrong-way on-street are common and account for the greatest number of recorded accidents in California, pointing to the need for safety education.

Land Use and Bicycling Demand

Land use patterns, along with several other factors, influence the demand for bicycling as well as bicycling patterns. Land use density may reduce trip distances and encourage cycling. The location of major activity centers such as employment centers, universities, public facilities, transit centers, regional shopping centers affect the bicycling patterns. The location of these regional centers should also serve as guideposts in the development of a county bikeway system which connects residents to key employment, shopping, recreational and educational centers.

San Mateo County has a mixture of high and low density land use patterns. Cities centered along the spine of the county, near Caltrain stations and the Bay tend to be higher in density, while those along the pacific side and hillsides are lower in density. Overall, of the 450 square miles of land in San Mateo County, only approximately 26% is urban land, comprised of residential, commercial, industrial, major infrastructure and urban open space, while the remaining 74% of land use is comprised of agriculture, rangeland, forest land, and wetlands. The overall population density of the County is 1,590 persons per square mile.

Major activity centers in and around the county include;

SFIA
Caltrain and BART stations
Britannia Development
Stanford University
Sun Microsystems
Skyline College
College of Notre Dame
Medical centers
City parks and civic centers throughout the County
Oyster Point office parks

Redwood Shores office parks
Bay Meadows Race Track
Coyote Point Recreation Area
Redwood Shores Ecological Area
Junipero Serra County Park
Beaches along Pacific coast communities
Sawyer Camp Trail and Crystal Springs Reservoir
Bicycle Sunday on Canada Rd.
College of San Mateo
Canada College
Borel Office Center (San Mateo)
Bay Hill Office Park (San Mateo)

The recommended bikeway system will attempt to connect these major activity centers to residential areas throughout the County.

Traffic and Air Quality Benefits

A key goal of the Bicycle Master Plan is to maximize the number of bicycle commuters in order to help achieve large transportation goals such as minimizing traffic congestion and air pollution. In order to set the framework for these benefits, national statistics and policies are used as a basis for determining the benefits to San Mateo County.

- Currently, nearly 3 million adults (about 1 in 60) commute by bicycle. This number could rise to 35 million if adequate facilities were provided (according to a 1991 Lou Harris Poll). Owing to San Mateo's mild climate, these numbers should be higher.

- The latent "need" for bicycle facilities--versus actual bicyclists--is difficult to quantify; we must rely on evaluation of comparable communities to determine potential usage.

- Mode split refers to the choice of transportation people make whether for work or non-work trips. Currently, the average household in the U.S. generates about 10 vehicle round trips per day, according to the ITE Trip Generation Manual. Work trips account for less than 30% of these trips on average.

- Using the 1990 U.S. census, almost 1% (2,606) of all employed San Mateo County residents commute primarily by bicycle. This does not include those who ride to work less than 50% of the time, nor does it always include those who may walk or ride to transit and list "transit" as their primary mode.

- Nationally, the mean travel time for adult employed bicycle and pedestrian commuters was 14.2 minutes, which translates roughly into a commute distance of about 3.5 miles for bicyclists.

- The U.S. Department of Transportation in their publication entitled "National Walking

and Bicycling Study" (1995) sets as a national goal the doubling of current walk and bicycling mode shares by the year 2010, assuming that a comprehensive bicycle and pedestrian system was in place. This would translate into a commute bicycle mode share of 1.5% or 5212 commuters in San Mateo County. Add to this number the number of commuters who bicycle occasionally, bike-to-transit, and students at local schools, and the average number of daily bicyclists in San Mateo County increases to an estimated 17,077 bicycle commuters by 2010. These bicyclists will be saving an estimated 4,457,880 vehicle trips and 8,483,340 vehicle miles per year.

- The combined benefit of these future bicycle commuters over the next 20 years is an annual reduction of about 156,093 lbs. of PM10 (Particulate Matter), 423,149 lbs. of NOx, and 615,890 lbs. of ROG.

- Bicycling is one of the most popular forms of recreational activity in the United States, with 46% of Americans bicycling for pleasure. These figures indicate that about 329,076 residents in San Mateo County do or would like to bicycle for pleasure. If nothing else, this indicates a latent demand for facilities and a potent constituency to push for better facilities.

Table 3 provides a detailed summary of bicycle demand and benefits.

Table 3
Demographics and Bicycle Transportation in San Mateo County

Population (1998 DOF estimate)	715,382
Land Use Area	450 sq. miles
Population Density	1,590 persons/sq. mile
Estimated San Mateo County Residents who would like to Bicycle for Pleasure	329,076
Current Bicycle Commute Mode Share (1990)	2,606 (0.75%)
Future Bicycle Commute Mode Share	1.5%
School-related bicycle commuters (20% of 7 to 14 year olds)	11,865
Total future bicycle commuters	17,077
Reduced Vehicle Trips/Year	4,457,880
Reduced Vehicle Miles/Year	8,484,340
Reduced PM10/lbs./Year	156,093
Reduced NOX/lbs./Year	423,149
Reduced ROG/lbs./Year	615,890

1 Assume 7 mile average round trip, and average of 200 commute days/year bike/walk commute for adult commuters and 100 commute days/year for students.

Table 4
San Mateo County Mode Split and Demographics by City

CITY	POPULATION (1990 Census)	% worked in city of residence	%worked outside city of residence	% Bicycled to Work
Menlo Park city	28040	23%	77%	4.5%
North Fair Oaks CDP	13912	9%	91%	2.7%
East Palo Alto city	23451	10%	90%	1.5%
Remainder of San Mateo	12595	0%	0%	1.1%
Redwood City city	66072	27%	73%	1.1%
Atherton town	7163	17%	83%	1.0%
West Menlo Park CDP	3959	7%	93%	0.8%
San Carlos city	26167	17%	83%	0.7%
Woodside town	5035	22%	78%	0.6%
San Mateo city	85486	29%	71%	0.6%
Portola Valley town	4194	17%	83%	0.5%
Belmont city	24127	14%	86%	0.4%
Foster City city	28176	13%	87%	0.4%
Highlands CDP	2644	4%	96%	0.4%
South San Francisco	54312	46%	4%	0.1%
Hillsborough town	10641	10%	90%	0.3%
Burlingame	26,801	48%	0.6%	0.5%
Emerald Lake Hills	3328	8%	92%	0.3%
TOTAL	345109	20%	76%	1.1%

Source: 1990 U.S. Census: employed adults age 16 and older

3.1.2 Recreational Needs

The needs of recreational bicyclists in San Mateo County must be understood prior to developing a system or set of improvements. While it is not possible to serve every neighborhood street and every need, a good plan will integrate recreational needs to the extent possible. The following points summarize recreational needs:

- Recreational bicycling in San Mateo County typically falls into one of three categories: (1) exercise, (2) non-work destination such as a park or shopping, or (3) touring.
- Recreational users range from healthy adults to children to senior citizens. Each group has its own abilities, interests, and needs.
- Directness of route is typically less important than routes with less traffic conflicts. Visual interest, shade, protection from wind, moderate gradients, or other features are more important.
- People exercising or touring often (though not always) prefer a loop route rather than
- having to back-track.

3.2 Crash Analysis

Bicycle-related crashes were collected for the past three years (1996-1998) in San Mateo County. A total of 283 bicycle-related crashes occurred in 1996, 329 in 1997, and 323 in 1998. While the low number of incidents and the lack of information to develop a meaningful accident rate make it difficult to draw a conclusion from this data, it is apparent that bicycle-related incidents are at the very least stable if not growing. Compared to other communities in California on the number of incidents per 1,000 persons, San Mateo County's annual rate (0.46 incidents per 1,000 persons) is slightly lower the average of .67 incidents per 1,000 persons.

Summary of Incident Locations

The bicycle accident data shows that the streets with high occurrence of incidents include State Route 82 (El Camino Real), Middlefield Road, and State Route 1. Other streets that show high occurrences include Woodside Road, State Route 84, South Norfolk Avenue, California Drive, Ralston Avenue, and Willow Road. Table 5 shows the streets with the highest occurrence of bicycle involved collisions.

Several specific intersections also stand out as high occurrence locations. Intersections with high incident rates are typically along the streets with the highest number of incidents, however several intersections stand out that are not on the streets with the highest incidents. Included are the intersections of Canada Road and Edgewood Road, and East Hillsdale Boulevard and Edgewater Boulevard in Foster City. Table 6 shows the intersections with the highest number of incidents.

In general, the accidents do not appear to be related to unusual street conditions such as constructions zones, obstructions, or pot-holes. Table 7 summarizes the number of accidents according to the road conditions.

Summary of Primary Cause and Severity of Accidents

The data show that about 35% of the collisions occur when the party at fault violates right-of-way rules (approximately 20 percent), or the bicyclist is traveling on the wrong side of the road (approximately 15 percent). Table 8 shows the age of bicyclists involved in accidents.

Several trends in violation types occur at the high incident locations. For example, the intersection of South Norfolk and Cottage Grove in San Mateo has a high occurrence of collisions due to unsafe travel speeds. On State Route 82, a high number of incidents are due to bicyclists traveling on the wrong side of the road, or involve other situations where the automobile has the right-of-way.

Age of Bicyclist Involved in Collisions

The majority of the bicyclists that are involved in the collisions belong to the younger age groups.

Table 5 shows the number of accidents for the top 10 age groups. Approximately 40% of the bicyclists involved in reported accidents are between the ages of 7 and 18 years old.

Table 6 and Table 7 show the accident locations and street conditions of bicycle-related accidents, respectively, on the highest incident streets.

Table 8 shows the number of accidents for the top 10 age groups. Approximately 40 percent of the bicyclists involved in reported accidents are between the ages of 7 and 18 years old.

Table 5
Annual Accidents by Street

Primary Street	1996	1997	1998	Three Year Total	% of Accidents
RT 82	32	51	41	124	13.3%
MIDDLEFIELD RD	10	11	11	32	3.4%
RT 1	6	6	5	17	1.8%
WOODSIDE RD	6	5	5	16	1.7%
RT 84	4	4	6	14	1.5%
S NORFOLK	2	5	7	14	1.5%
CALIFORNIA DR	4	2	7	13	1.4%
RALSTON AV	4	3	6	13	1.4%
WILLOW RD	2	5	6	13	1.4%
RT 35	4	4	4	12	1.3%
BAY RD	4	2	5	11	1.2%
ALAMEDA DE LS PLGS	3	4	3	10	1.1%
N SAN MATEO DR	4	3	3	10	1.1%
OLD COUNTY RD	4	3	3	10	1.1%
UNIVERSITY AV	3	3	4	10	1.1%
Other	191	218	207	616	65.9%
TOTAL	283	329	323	935	

Table 6
Accidents by Intersections

Rank	Primary Street	Secondary Street	# of Accidents
1	CANADA RD	EDGEWOOD RD	4
1	E HILLSDALE BL	EDGEWATER BL	4
1	MIDDLEFIELD RD	5 AV	4
1	MIDDLEFIELD RD	CHESTNUT	4
1	RT 82	9 AV	4
1	RT 82	BROADWAY AV	4
1	RT 82	CENTER	4
1	S NORFOLK	COTTAGE GR AV	4
1	WILLOW RD	NEWBRIDGE	4
10	JEFFERSON AV	HUDSON	3
10	MIDDLEFIELD RD	GLENWOOD AV	3
10	MIDDLEFIELD RD	OAK GROVE AV	3
10	MIDDLEFIELD RD	PACIFIC AV	3
10	N SAN MATEO DR	E POPLAR AV	3
10	NEWBRIDGE	WILLOW ALY	3
10	PORTOLA RD	PHILLIP RD	3
10	RT 35	KINGS MTN RD	3
10	RT 82	CAMBRIDGE AV	3
10	RT 82	CHARTER	3
10	RT 82	DUMBARTON AV	3
10	RT 82	JEFFERSON AV	3
10	RT 82	PONDEROSA RD	3
10	RT 82	WATKINS AV	3
	Other		857
	Total		935

*Intersections with 3 or more accidents

Table 7
Street Conditions at Location of Accident

Road Condition	Number of Accidents
No unusual conditions	896
Pot-Holes	8
Other	7
Construction Zone	7
Obstruction on RDWY	5
Loose Material on RDWY	4
Total	935

Table 8

Age of Bicyclists Involved in Accidents

Table A8

Rank	Age of Bicyclist	Number of Accidents	% of Accidents
1	11	45	4.9%
1	13	45	4.9%
3	12	32	3.5%
4	14	31	3.4%
5	17	27	2.9%
6	10	26	2.8%
7	9	25	2.7%
8	8	24	2.6%
8	15	24	2.6%
10	23	23	2.5%
11	31	22	2.4%
	Other	553	60.4%
	Total	916	

4.0 Recommended System & Improvements

The recommended system and improvements consists of two distinct components:

Bicycle System
Bicycle Programs

Physical improvements to implement a bicycle system are covered in this chapter, while program and implementation recommendations are provided in a following chapter.

4.1 Bicycle System

The recommended bicycle circulation strategy consists of a system of primary routes, lanes, and paths connecting San Mateo County residents to major regional destinations such as colleges and universities, parks, libraries, business districts, regional shopping centers and major employers. The objective of the primary system is to provide a framework for bicycle travel in the County. It is not meant to supplant local bikeway systems nor to imply that bicyclists can only use these routes. The Plan also serves as a resource by recommending multi-jurisdictional projects, ensuring that bikeways connect from city to city, that a consistent set of facilities is provided, and numerous standards and guidelines that can be adopted by each city and jurisdiction as they see fit. Wherever possible, the primary system was developed using city's existing and proposed bikeway network.

It is up to local jurisdictions to adopt and implement the Plan recommendations, many of which coincide with current local plans. The primary system identified in this Plan does not supplant or replace the local bikeway system. The proposed primary bikeway system is shown (broken down into sections of the County) in Figures 2-7.

The proposed San Mateo County Bikeway system is characterized by (1) a new system of signage through the primary north-south county bicycle corridor (2) enhanced regional connections to bordering counties including Santa Clara County, San Francisco County, and the Dumbarton and San Mateo Bridges, (3) improved and new pathways along the San Mateo County bayside shoreline, (4) new bike lanes and other improvements where feasible, and (5) new bicycle support facilities such as signal detectors and bicycle parking. At a minimum, all bicycle routes identified on the Plan will be Class III bike routes and include intersection protection where needed, wide curb lanes where possible, traffic calming where needed to slow traffic, shoulder striping where feasible, and signing.

The top short term bikeway projects were selected by C/CAG staff, the Bicycle and Pedestrian Advisory Committee, the public, and bikeway specialists based on their local knowledge and cycling experience, the orientation of funding programs, and the planning criteria outlined in the following section (4.2 creating a Bikeway System). Longer term regional systems such as the Bay Trail and Ridge Trail systems are included in some of the top short term bikeway projects. These systems, where they are intended to serve bicyclists, should be implemented as conceived by the regional and local agencies.

4.2 Creating a Bikeway System

A bikeway system is a network of bicycle routes that, for a variety of reasons including safety and convenience, provide a superior level of service for bicyclists and are targeted for improvements by the County and Cities due to address existing deficiencies. It is important to recognize that, by law, bicyclists are allowed on all streets and roads regardless of whether they are a part of the bikeway system. **The primary bikeway system is a tool that allows the County and Cities to focus and prioritize implementation efforts where they will provide the greatest community benefit and serves as a guiding and coordinating tool for Cities and the County as they plan their individual, local bikeways.**

There is an established methodology for selecting a bikeway system for any community. The primary method is to receive input from the local bicycling community and local staff familiar with the best routes and existing constraints and opportunities. Input can be received through a variety of means, but typically is through the public workshop format. Two public workshops were held in San Mateo County on June 3rd and June 17th, 1999, where citizens were asked to identify the routes they regularly ride plus corridors they saw as either opportunities or constraints. The recommendations of the Plan were presented to the public in two workshops (September 30 and October 7, 1999), where feedback was received on the Plan. In addition, an extensive survey was conducted and more than 300 responses collected that helped identify the types and locations of improvements designed to meet citizen's needs.

The following criteria are typically used to develop a bicycle system:

- Existing Bicycling Patterns
- Connectivity
- Traffic volumes and travel speeds
- Amount of side conflict (driveways, side streets)
- Curb-to-curb width
- Pavement condition
- Access from residential areas
- Number of destinations served
    - Schools
    - Parks and Shorelines
    - Employment Centers
- Topography
- Integration into the regional system
- Adjacent land use
- On-street parking
- Accident data and safety concerns
- Existing bottlenecks or constraints
- Existing opportunities such as planned roadway improvements

The San Mateo County bikeway system was developed focusing on connecting existing segments of bike lanes, addressing routes used by bicyclists, and focusing on specific opportunities and constraints. The street grid pattern offered several distinct through corridors which connected residential areas with activity centers such as downtowns, schools, and parks.

Once a bikeway system has been identified, the greatest challenge is to identify the top segments that will offer the greatest benefit to bicyclists in the next five years. Aside from the criteria used in developing the system as a whole, selection of these top projects is based on:

- The number of schools served;
- The number of recreational centers served. If the segment is a Class I multi-use trail, the pathway itself may qualify as a recreational destination.
- The number of employment centers served;
- The number of areas where bicycle safety is addressed, i.e., corridors with high traffic volumes and narrow travel lanes; and
- Segments that help overcome existing gaps in the bicycling system.

In addition, one of the major objectives of this Plan is to complete a primary north-south bicycle route to provide connections between cities and identify an alternative route to El Camino Real. The top 15 short term projects (Years 1-10) are described in greater detail below. While these projects represent the highest priority projects on the primary bikeway system, other local bikeways may actually be higher local priorities and may be implemented first in some cases.

Finally, it is important to remember that the bikeway system and the top projects are flexible concepts that serve as guidelines to those responsible for implementation. The system and segments themselves will be refined over time by C/CAG and local agencies as a result of changing bicycling patterns and implementation constraints and opportunities.

4.3 Description of Proposed Bikeway Improvements

Short Term (Years 1-10) Projects

The following 15 projects have been identified as the top priority short term bikeway projects in San Mateo County, to be implemented over the next 10 years. The projects were selected by a variety of criteria, and do not include program recommendations that are covered in a separate section (see Sections 4.4-4.8). The criteria used to select the short term projects include (a) staff and Committee recommendations, (b) recommendations gathered through public workshops and surveys, (c) projects already identified by cities or other agencies, (d) completion of the North-South Primary Bikeway in the County, (e) overcoming major obstacles, gaps, and constraints, (f) a mixture of commuter and recreational projects, (g) service to (or near) all regional destinations and connections such as Caltrain and BART stations, and (h) geographic balance and service to all cities. Most of the projects are multi-jurisdictional projects, which meets the spirit and goals of many funding programs. Most of the projects are identified on existing Bikeway Plans by local jurisdictions. Most of the projects are north-south projects, although a significant number also enhance east-west travel by focusing improvements on improved access across the Bayshore Freeway. Finally, the projects should be considered as corridors rather than specific streets, allowing local agencies to select alternative streets as appropriate.

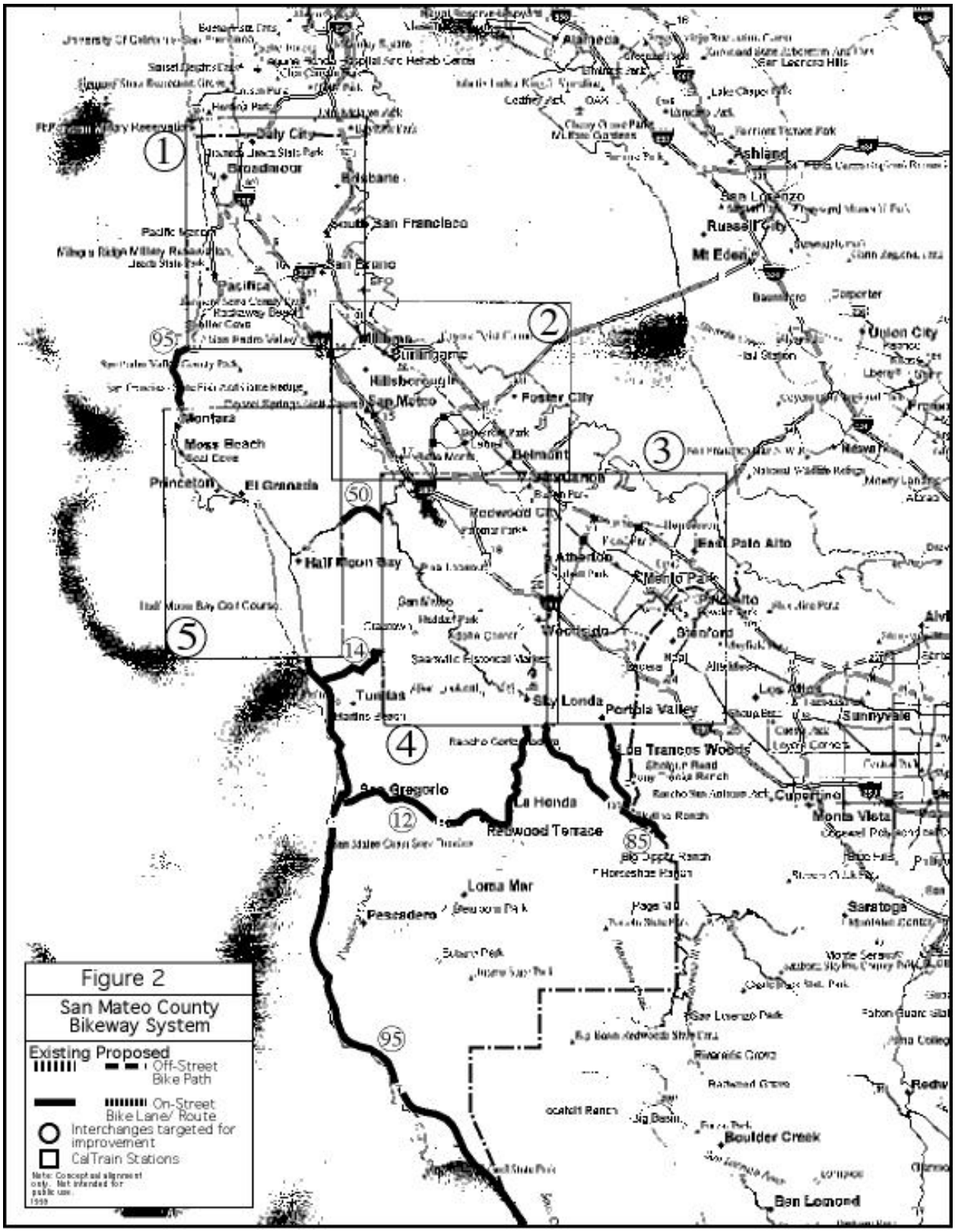
Figure 2
San Mateo County
Bikeway System
Existing Proposed
Off-Street
Bike Path
On-Street
Bike Lane/ Route
Interchanges targeted for
improvement
CalTrain Stations
Note: Conceptual alignment
only. Not intended for
public use.
1999
Daly City
Broadmoor
Brisbane
South San Francisco
San Bruno
Pacifica
Millbrae
Burlingame
Hillsborough
San Mateo
Foster City
Belmont
Montara
Moss Beach
Princeton
El Granada
Half Moon Bay
Redwood City
Atherton
East Palo Alto
Menlo Park
Palo Alto
Woodside
Stanford
Los Altos
Sunnyvale
Portola Valley
Los Trancos Woods
Cupertino
Monta Vista
Saratoga
Los Altos Hills
Ashland
San Lorenzo
Russell City
Mt Eden
Union City
Newark
Tunitas
Sky Londa
San Gregorio
La Honda
Redwood Terrace
Loma Mar
Pescadero
Boulder Creek
Ben Lomond
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2
3
4
5
50
14
12
85
95
92

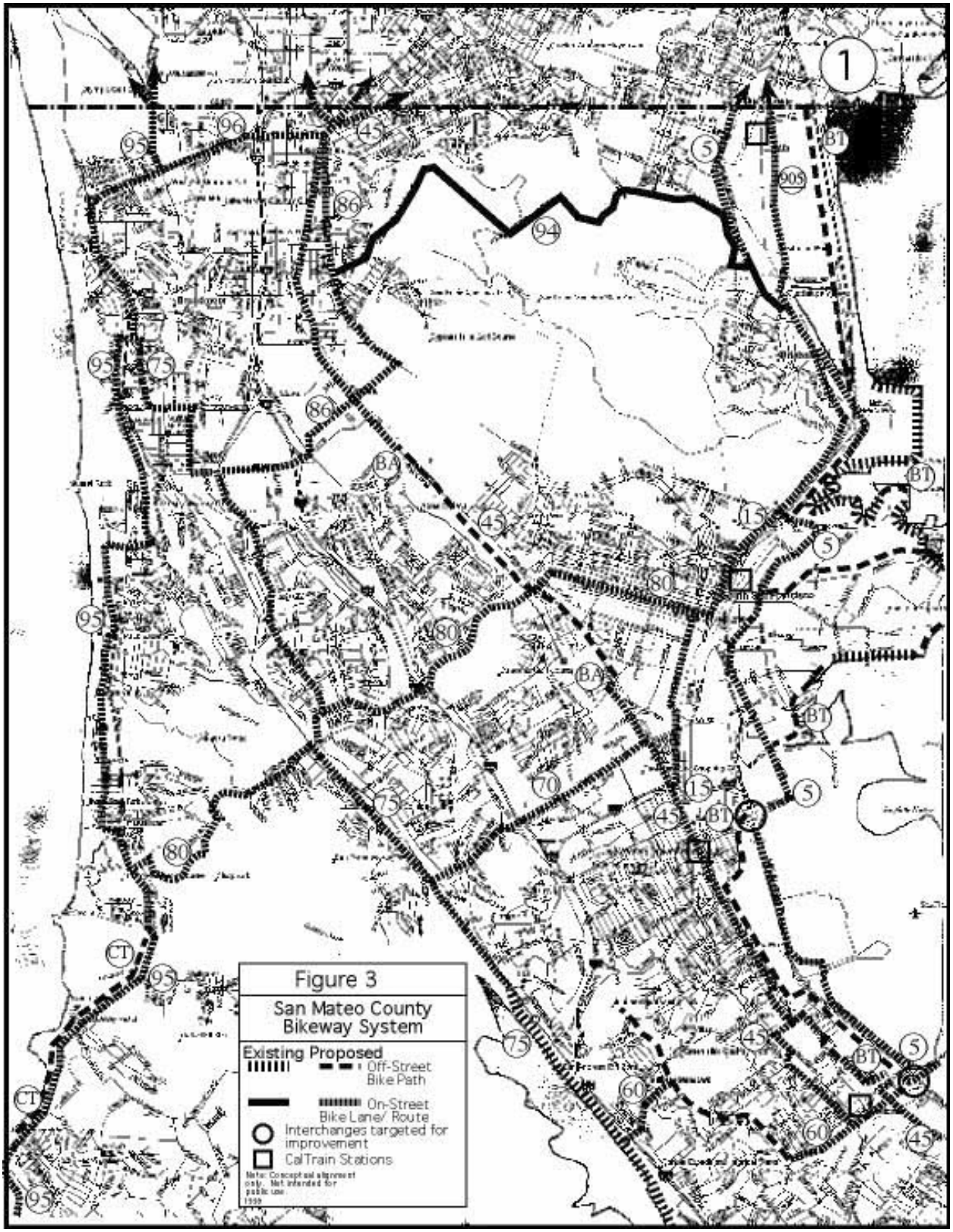
Figure 3
San Mateo County
Bikeway System
Existing Proposed
Off-Street
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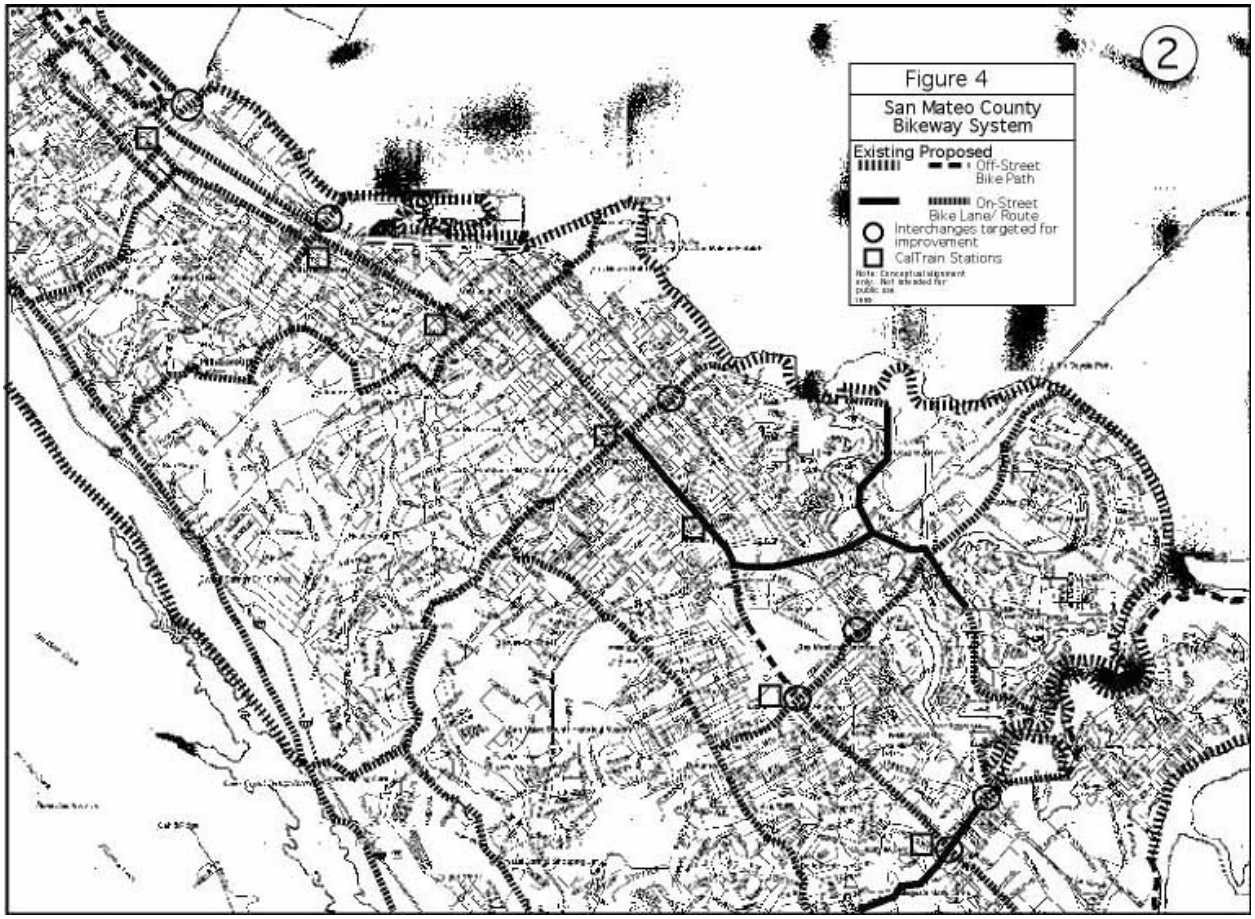
Interchanges targeted for
improvement
CalTrain Stations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San Mateo County
Bikeway System
Existing Proposed
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Bike Path
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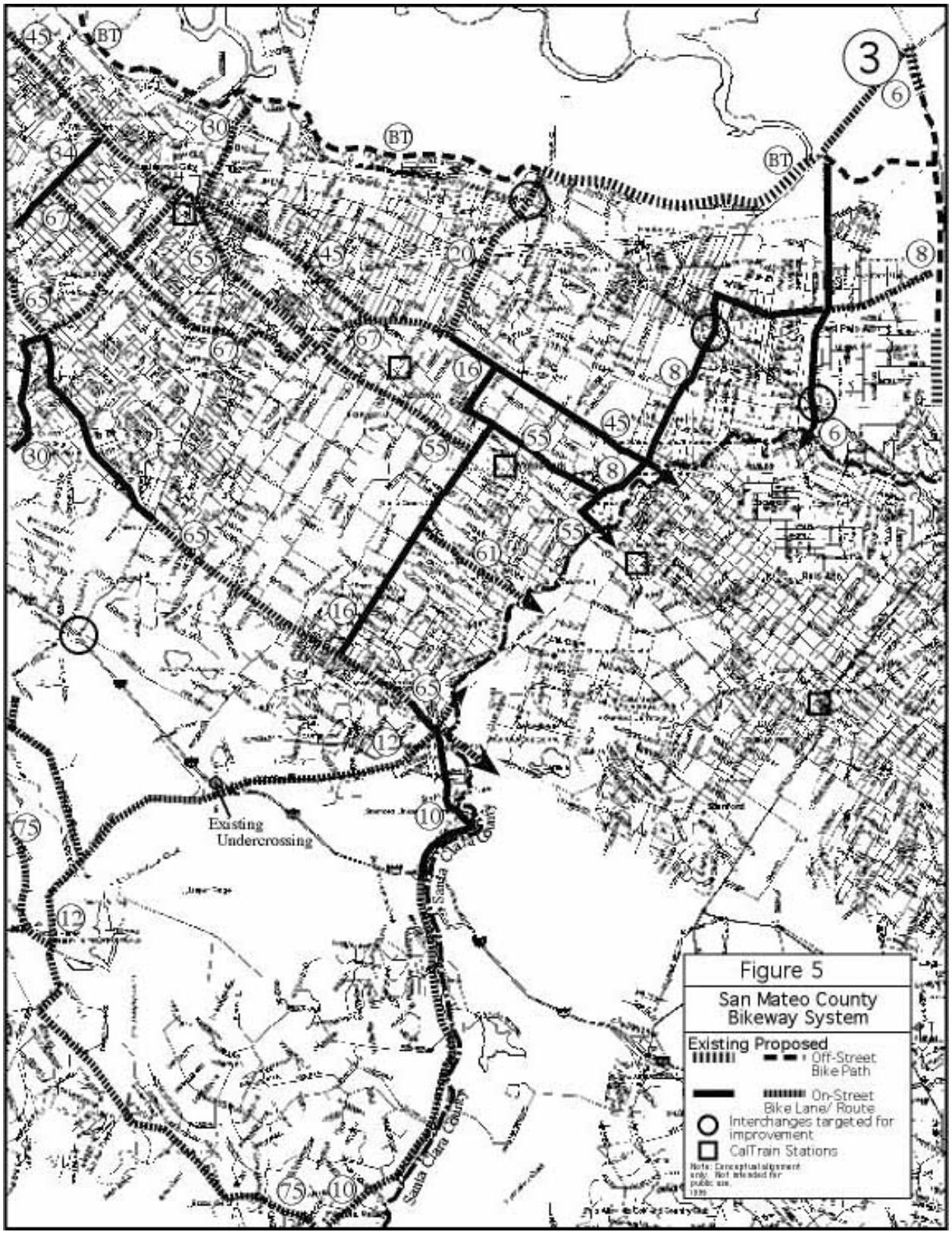
Bike Lane/ Route
Interchanges targeted for
improvement
CalTrain Stations


Existing
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Bikeway System
Existing Proposed
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Bike Path
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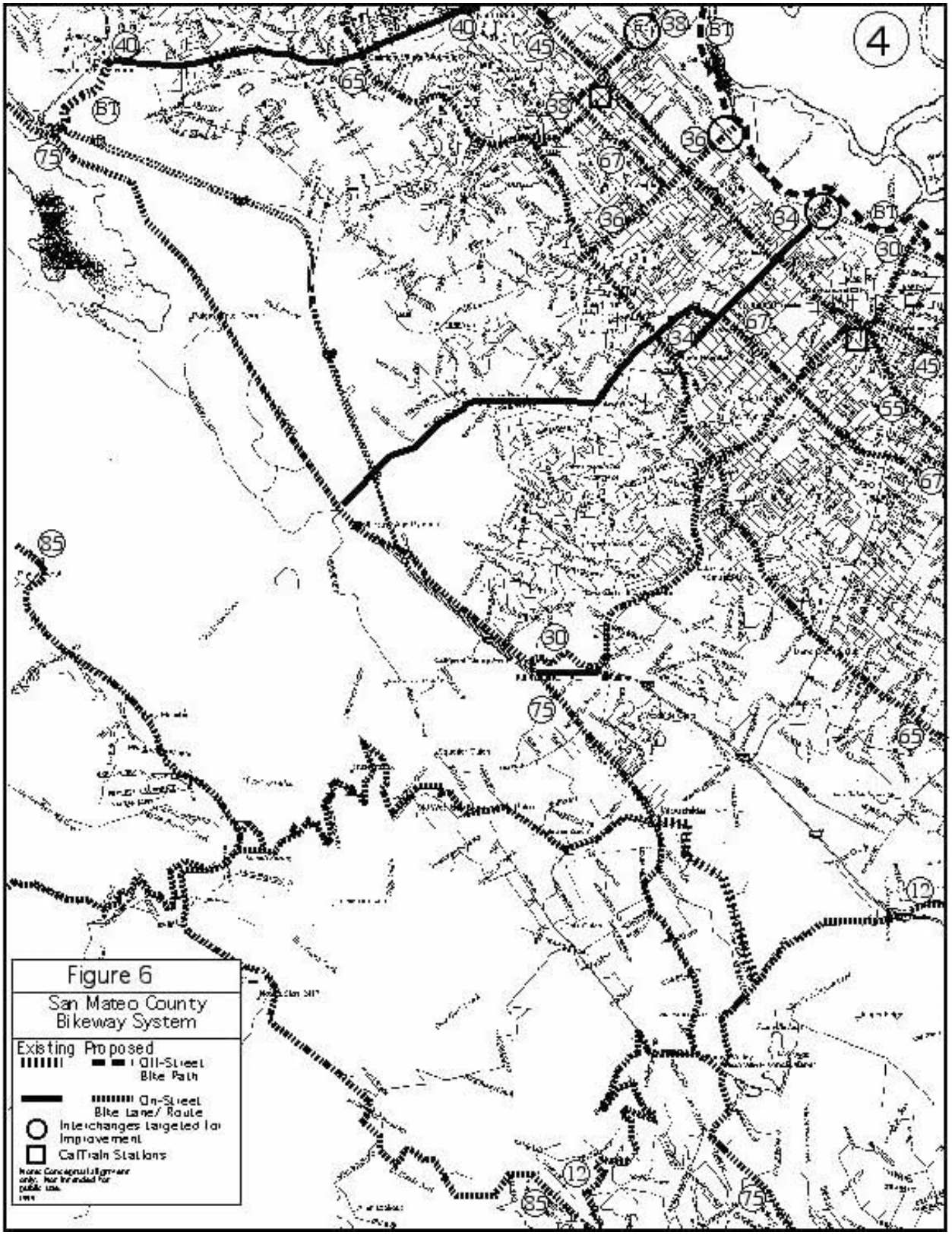
Bike Lane/ Route
Interchanges targeted for
improvement
CalTrain Stations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San Mateo County
Bikeway System
Existing Proposed
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Bike Path
On-Street
Bike Lane/ Route
Interchanges targeted for
Improvement
CalTrain Stations

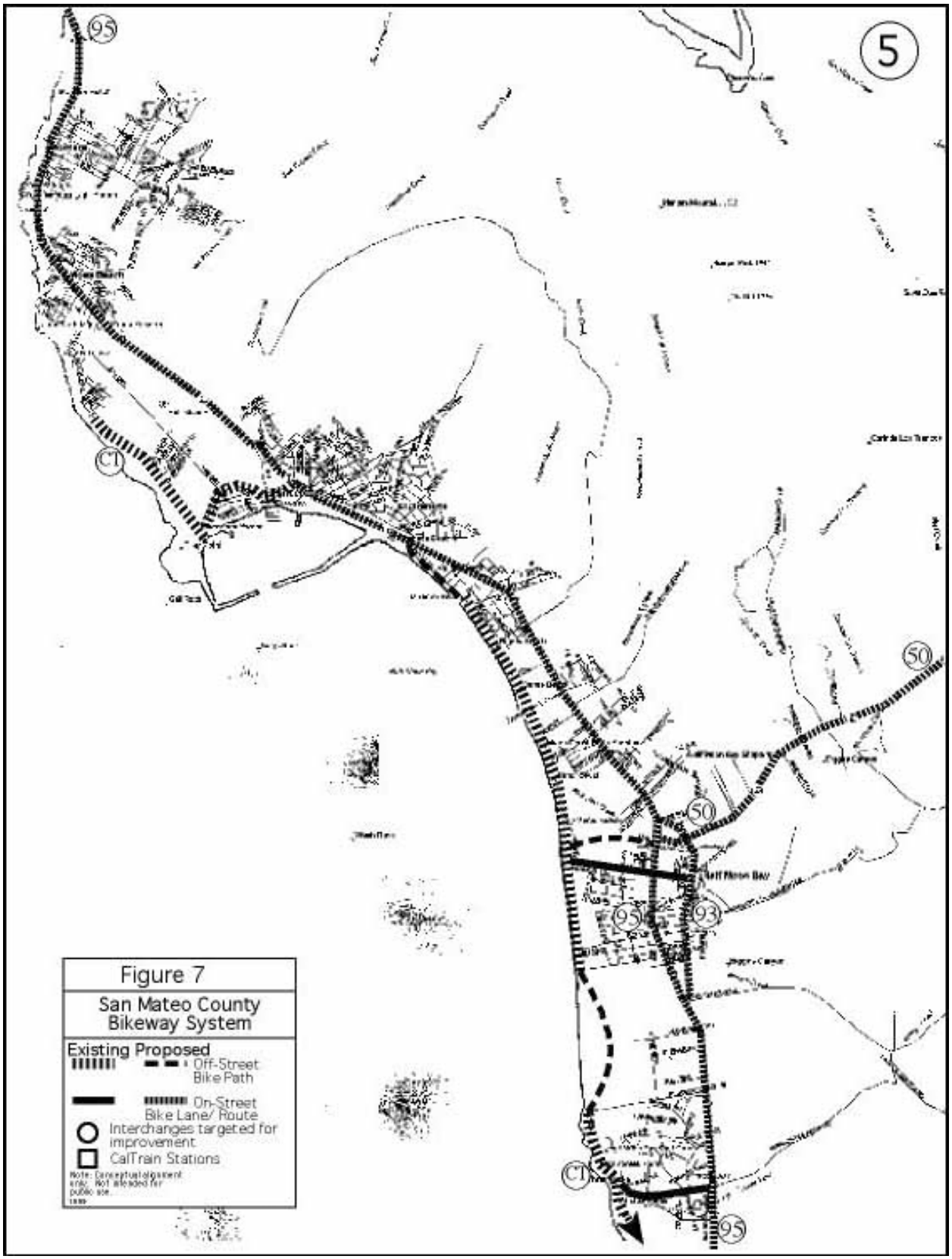
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Figure 7
San Mateo County
Bikeway System
Existing Proposed
Off-Street
Bike Path
On-Street
Bike Lane/ Route
Interchanges targeted for
improvement
CalTrain Stations

Project #1:
North-South Bikeway Signing Project

City(ies):	**Daly City, Colma, South San Francisco, San Bruno, Millbrae, Burlingame, San Mateo, Belmont, San Carlos, Redwood City, Atherton, Menlo Park**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**Sign and Signal Detector Plan/Design**
Cost:	**$560,000**

This 37.4 mile project will provide the greatest immediate benefit to bicyclists in San Mateo County by providing directional signage and intersection improvements (signal detectors) for north-south travel from San Francisco to the Palo Alto border. Currently, bicyclists must either use major arterials such as El Camino Real or find their way through a maze of secondary streets. The signing program will identify the preferred commuter route aimed at the bicyclist of moderate abilities and experience. The program will also help promote bicycling by its high visibility, improve confidence that a 'system' does exist, and help advise motorists to expect bicyclists on this route.

The North-South Bikeway will serve as the primary spine for local and regional bicycle travel in the County. The Bikeway will link virtually all of the major regional destinations including Caltrain Stations, downtowns, and other large employment centers. The signing program is designed to provide immediate benefits, to be followed by other physical improvements on a segment basis. Some of those other improvements are identified in the Top Priority Project list.

The North-South Bikeway Signing Program will consist of approximately 200 sign locations posted along the entire route, at least every 800 meters (about ½ mile) or where the route changes directions. The proposed Route Numbering System is shown in the appendix, and may be coordinated with San Francisco and Santa Clara Counties. The sign locations will consist of Class II (Bike Lane)or III (Bike Route) signs, Route Number signs with Route Number designations, directional signs to nearby destinations, and 'Share the Road' signs where appropriate. Where appropriate, "Bay Trail" and often regional signs will be included.

The North-South Bikeway consists of several alternative routes along its length, in some cases to connect to points in adjacent counties and in other cases to provide bicyclists with alternative routes to riding through busy downtown areas. Directional signs will indicate the destinations of each route at key junctions, or simply 'Alternate Route" for those wishing to avoid busy areas such as downtown Redwood City.

03/00

PROTOTYPICAL SIGN

alta

03/00

PROTOTYPICAL SIGN

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SHARE THE ROAD SIGN

Project #2:
Colma-Millbrae Bikeway Project

City(ies):	**Millbrae, San Bruno, South San Francisco, Colma**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**BART, Caltrans, SFWD, SMFCD**
Required Studies/Actions:	**Feasibility Study, CEQA, Design**
Cost:	**$1.5 Million**

This project was mandated as part of an agreement between BART and San Mateo County related to the BART SFO extension project. The agreement calls for a multi-use trail or on-street alternative between Colma and Millbrae to be located within the BART right-of-way to the extent feasible, and provides $2 million in funding. A feasibility study conducted by BART has determined that a bikeway is feasible utilizing both existing streets and the BART right-of-way to provide a functional commuter bicycle facility. This project could serve as the northern segment of the North-South Bikeway. This project would be coordinated with the SFO-Bay Trail project in the San Bruno – Millbrae vicinity, with the southern end possibly serving as a section of the Bay Trail.

Project #3:
Ralston Avenue Bikeway Projects

City(ies):	**San Mateo, Belmont**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**Feasibility Study, Design**
Cost:	**3,140,000 (Total project cost)**

Ralston Avenue in Belmont is identified as part of the Primary Bikeway System in San Mateo County, providing east-west connections from the Bay Trail to downtown Belmont and the Caltrain Station. Ralston already has bike lanes from Highway 92 to the Bayshore Freeway. The Bayshore Freeway interchange and the Caltrain/El Camino Real intersection represent major barriers to bicyclists due to high-speed ramps and heavy traffic. The City of Belmont is already pursuing funding to construct a new bicycle/pedestrian crossing of the Bayshore Freeway and of El Camino Real connecting to the Caltrain Station. In addition, the city is pursuing other bicycle – related projects in the vicinity that will improve bicycle access and convenience.

Project #4:
North-South Bikeway (Southern Section)

City(ies):	**Menlo Park, Atherton, Redwood City**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**Preliminary Design, Design**
Cost:	**$220,000**

The North-South Bikeway from downtown Redwood City through Atherton and Menlo Park and into Palo Alto is proposed to utilize two routes, Middlefield and El Camino Real. This section of the North-South Bikeway is anticipated to experience high use considering the high level of bicycling in the area, especially Menlo Park. It will also require close coordination with the City of Palo Alto, which is currently re-doing its Bicycle Master Plan.

This project consists of implementing improvements on Main Street and El Camino Real in Redwood City and Atherton, including signal improvements, signing, striping, lane re-striping, and other items as feasible. Preliminary analysis indicates that El Camino Real, while carrying higher traffic volumes, offers relatively few side streets and is a good direct bicycle commuter route into Menlo Park. The project also includes improvements to 5th Avenue, Middlefield Road, and Semicircular Road to provide a connection between existing bike lanes on Middlefield in Menlo Park and Redwood City. This connection will also serve bicyclists headed for the Hudson-Selby Bypass Route of downtown Redwood City.

Project #5:
San Mateo Bay Trail

City(ies):	**Redwood City, San Carlos, Menlo Park**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**BCDC Permit, CEQA, Feasibility Study, Design**
Cost:	**$2,000,000**

Several significant portions of the Bay Trail have been developed in San Mateo County, all of which enjoy tremendous popularity. There are numerous small and large gaps that remain, including a gap around the San Francisco International Airport. This gap has been studied extensively by the Association of Bay Area Governments (ABAG) with the conclusion that the project is viable but costly ($8 million). Due to the cost and other factors this segment is identified is a mid-term project.

The proposed short term Bay Trail project is a major gap between existing Bay Trail segments ending at Bayfront Park in Menlo Park and starting again in Redwood Shores in Redwood City. The project would consist of both on-and off-street improvements in conjunction with other projects such as the U.S. 101 Auxiliary Lane project. The project would be constructed in conjunction with the restoration of Bair Island. Once completed, Bay Trail users would be able to travel uninterrupted between Burlingame and East Palo Alto. There are major obstacles to this project including environmental impact, cost, property acquisition, and security (including proximity to the San Carlos Airport). However once completed, this section would result in an uninterrupted Bay Trail from East Palo Alto to Burlingame.

Project #6: Recreational Route Bikeway Improvements

City(ies): **Woodside, County, Portola Valley**

Primary Responsibility: **Public Works of Cities Listed Above**
Right-of-Way Control: **Cities, Caltrans**
Required Studies/Actions: **Preliminary Design, Design**
Cost: **$2.2 Million**

Recreational bicycling on the secondary roads in San Mateo County is highly popular with all types of bicyclists, from families to club riders to long distance riders. Most of these routes offer shoulders and provide a reasonable facility for bicyclists, while others require a variety of treatments to improve conditions. Roads mentioned by many bicyclists as requiring some type of improvements include Alpine Road, Canada Road, Whisky Hill Rd., Woodside Rd., Old La Honda Rd., Kings Mountain Rd., Tripp Rd., Portola Rd., Mountain Home Road, La Honda Road, and Skyline Boulevard. These treatments may include improved or new (a) fog lines, (b) shoulders, (c) bridges, (d) Bike Route and/or Share the Road signs, and (e) enhanced maintenance to keep the shoulder areas free of debris. Old La Honda Road may require additional work as it has a steep incline and limited room for shoulder expansion. Some bicyclists identified the potential use of Bear Gulch Road as an alternative to the busy La Honda Road. This formerly public road is now a private road providing access to local residences, although there is the possibility that public ownership extends to the middle of the pavement. The Mid Peninsula Regional Open Space District recommends including a paved bike route on the closed portion of Upper Alpine Road to allow road bicyclists access to Highway 35 (Skyline Blvd.) from Portola Valley.

Project #7:
North Coast Bikeway

City(ies):	**Pacifica, Daly City**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**Feasibility Study, Design**
Cost:	**$748,000**

This project provides the only linkage between the neighborhoods of Pacifica and western Daly City into San Francisco. It is also the best alternative for the numerous bicyclists riding the Coastal Route between San Francisco and Half Moon Bay and points south. The project starts at the San Francisco border on Lake Merced Boulevard in Daly City, continues south to John Daly Blvd. to south Mayfair Avenue, then to Westmoor Avenue, and Skyline Drive into Pacifica. Once in Pacifica, the route continues along the coast line on Palmetto to Esplanade Drive, Palmetto Avenue, Francisco Boulevard frontage road, and onto Highway One at Mori's Point Road at Sharp Park Beach. From this point the project is located on Highway One, a busy four-lane highway to Linda Mar Boulevard. Eventually bicyclists would be directed to either the new tunnel to Half Moon Bay and/or to the current Highway One route, which may be preserved as a bicycle-only route in the future.

Typical improvements on this project include shoulders on Highway One, possibly in tandem with a new multi-use pathway on one side of the road. The remainder of the route will need mostly new directional signing, along with other minor physical improvements.

Project #8:
North-South Bikeway (Old County Road Section)

City(ies):	**Redwood City, San Carlos, Belmont, San Mateo**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions	**Feasibility Study: Design**
Cost:	**$279,000**

This project is one of the key central portions of the proposed Primary North-South Bikeway in San Mateo County. The project starts in downtown Redwood City on Winslow Street, crosses to Arguello Street after two blocks, continues for several blocks to Whipple Avenue, A Street, and finally crosses to Old County Road. A potential alternative or additional route through this section would be Industrial Road to Winslow Street, although this corridor has a high number of trucks. Old County Road is the main north-south alternative to El Camino Real for bicyclists, even though it is not an ideal route. The road has angled parking in sections, has a moderate number of trucks and overall traffic volumes, and inconsistent widths and pavement conditions. This project will focus on making Old County Road as bicycle-friendly as possible, including providing consistent minimum curb lane widths (or bike lanes, if possible). (Stafford Ave. + Pacific Blvd.)

The project continues at the end of Old County Road into the Bay Meadows Race Track, where informal passage is provided to bicyclists through the parking lot. Improvements here should include formalizing public use through this property and providing a route on the perimeter of the parking area so as to minimize vehicle conflicts.

Project #9:
Coastside Bikeway Projects

City(ies):	**Half Moon Bay, County**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions	**Preliminary design, design**
Cost:	**$1.4 Million**

The San Mateo County coast around Half Moon Bay is a rapidly growing area and a major recreational destination for bicyclists. Coastside Bikeway Projects include Highway 92 between I-280 and Half Moon Bay, which serves as the primary east-west route in the County for motorists and bicyclists alike. Currently, bicycles are temporarily not allowed west of Skyline Boulevard at the summit due to re-construction of the highway. This project consists of improvements to the corridor and specific locations, such as the Highway 92/Highway 35 (Skyline Boulevard) intersection immediately west of I-280. This intersection is problematic for bicyclists because of the high speeds and limited visibility and room for bicyclists, especially those transitioning from eastbound Highway 92 to northbound Skyline Boulevard. Planned and potential improvements include (a) new 7 foot shoulders along the entire length of Highway 92 from Highway 35 to Highway 1, and (b) a new pathway along the south/west side of Highway 92 between the Highway 35 intersection and the I-280 Bike/Pedestrian over-crossing.

Other Coastside projects include extensions of the Coastside Trail north and south from Half Moon Bay, providing a paved multi-use trail for recreational cycling and an alternative to using busy Highway 1. The Pilarcitos multi-use trail will connect downtown Half Moon Bay with the Coastline Trail, providing a safer, grade separated crossing of Highway 1. South of Half Moon Bay, the trail is called Coastal Trail.

Project #10:
U.S. 101/Willow Road Interchange Project

City(ies):	**East Palo Alto, Menlo Park**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions	**Project Report, Design**
Cost:	**$50,000 (feasibility only)**

Willow Road is identified as part of the Primary Bikeway system in San Mateo County, providing an important connection between Menlo Park, East Palo Alto, the Bay Trail, and the Dumbarton Bridge. As with many interchanges, the Willow Road/Bayshore Freeway interchange consists of high speed on- and off-ramps, which pose a significant constraint to all but the most experienced bicyclist. Caltrans has programmed many older-type cloverleaf interchanges for retrofitting, and this interchange may be improved in the future. If not, there are a variety of options to make the interchange more bicycle-friendly, ranging from modest improvements (such as signing, warning lights, wider shoulders) to major improvements (a new bicycle-pedestrian over-crossing). A more detailed feasibility study or project report performed in conjunction with Caltrans should be performed to resolve these issues.

Project #11:
North-South Bikeway (Bayshore Corridor)

City(ies):	**South San Francisco, Brisbane**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions	**Feasibility Study, Design**
Cost:	**$142,000**

The Primary North-South Bikeway is proposed to split in San Bruno, with one leg following the BART-SFO multi-use trail (see Project #2) towards Mission Street in southwest San Francisco, and another leg following Bayshore Boulevard towards southeast and ultimately downtown San Francisco. This project starts at Huntington Avenue, and continues on Herman Street, South Linden Avenue, and Linden Avenue into downtown South San Francisco. The project jogs on 4th Avenue to Airport Boulevard, and continues northward until it turns into Bayshore Boulevard. By many accounts, this corridor, while the only one available to bicyclists in this area, is one of the highest traffic and difficult segments (including several high speed freeway ramps) to ride in the County. An alternative corridor along the east side of U.S. 101 may be preferable, linking the Oyster Point and Sierra Point areas. This corridor would significantly mitigate a dangerous mix of high speed traffic and bicycle commuters along Old Bayshore and the Oyster Point interchange. An alternative corridor would provide an additional benefit by linking to the existing bikeway on the east side of the lagoon, a bikeway that currently dead ends at Sierra Point. The project serves downtown Brisbane before heading north on Tunnel Avenue into San Francisco. This last stretch traverses an industrial area and has a high number of trucks. Reconstruction of Tunnel Rd. to provide shoulders or bike lanes, possibly as part of future redevelopment in the area, is recommended.

Project #12:
U.S. 101/Broadway Bikeway Project

City:	**Burlingame**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions	**Project Report, Design**
Cost:	**$50,000 (feasibility only)**

The Bayshore Freeway/Broadway interchange was identified by numerous bicyclists as a major impediment to bicycling in the area. While Broadway is a relatively short section of the proposed Primary Bikeway System, it also provides a key connection from Burlingame to Bayside Park and the proposed Bay Trail. As with many interchanges, Broadway/Bayshore Freeway interchange consists of high speed on- and off-ramps, which pose a significant constraint to all but the most experienced bicyclist. Caltrans has programmed many older-type interchanges for retrofitting, and this interchange may be improved in the future. If not, there are a variety of options to make the interchange more bicycle-friendly, ranging from modest improvements (such as signing, warning lights, wider shoulders) to major improvements (a new bicycle-pedestrian over-crossing). A more detailed feasibility study performed in conjunction with Caltrans should be performed to resolve these issues.

Project #13:
North-South Bikeway (Delaware-California Section)

City(ies):	**San Mateo, Burlingame, Millbrae**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans**
Required Studies/Actions:	**Feasibility Study, Design**
Cost:	**$193,000**

This project constitutes the key central portion of the proposed Primary North-South Bikeway. The project starts at the Bay Meadows Race Track entrance in San Mateo, which is already used as an informal route by many bicyclists. The project continues on Delaware Street into San Mateo, utilizing about 1-mile of existing bike lanes until 4th Avenue. An alternative or additional alignment through San Mateo may include Palm Avenue and San Mateo Avenue, which run parallel to Delaware, although Central Park creates a gap in this linkage.

The project continues northward on Delaware Street to Bayswater Avenue, turning west until Myrtle Road, north several blocks to Burlingame Avenue (and the Caltrain Depot), and then north again on California Drive. An alternative or additional route may be N. Carolan Avenue between Burlingame Avenue and Broadway. California Drive extends for several miles parallel to the Caltrain tracks, and has moderate traffic volumes and speeds. While California provides direct access to the Millbrae Caltrain (and future BART station), access for southbound bicyclists from El Camino Real is constrained. Therefore, the Primary North-South Route jogs from California west on Murchison, across El Camino Real, and then north again on Magnolia Avenue. Magnolia has low to moderate traffic volumes, some rolling hills, and provides access to downtown Millbrae. The North-South Bikeway jogs over to Broadway at Meadow Glen, and then across El Camino Real at Center Street. At this point it connects to the BART-SFO Bikeway Project (see Project #2) At San Anselmo Street.

Project #14:
Crytsal Springs-3rd/4th Avenue Bikeway

City (ies):	**San Mateo, San Mateo County - Hillsbrough**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**City, Caltrans**
Required Studies/Actions	**Preliminary Design, Design**
Cost:	**$168,000**

Most east-west routes in the developed portions of San Mateo County are relatively short sections. Some of the top priority projects focus on east-west constraints at El Camino Real and the Bayshore Freeway, but not on the entire corridor. The Crystal Springs-Third Street Bikeway is included for a variety of reasons, including the fact that it links directly to popular recreational routes at Skyline Boulevard, connects to the College of San Mateo, serves downtown San Mateo and the Caltrain station, crosses Bayshore Freeway at a busy interchange, serves as a northern gateway into Foster City, and terminates at the Bay Trail.

The project starts where Crystal Springs Road meets Skyline Boulevard and the trailhead for the Sawyer Camp Bike Trail. Crystal Springs is a windy two-lane road and primary access for recreational bicycling in San Mateo County. Improvements to Crystal Springs includes providing consistent shoulders for its entire length to the extent feasible. The route transitions onto 3rd and/or 4th Avenues through downtown San Mateo. Both of these streets are heavily-used by traffic with heavily-used on-street parking. Improvements through downtown San Mateo may include re-timing signals so that traffic moves at a more comfortable speed for bicyclists (about 20 mph), curb lane re-configuration, and signing/stenciling.

Project #15:
SFIA East Side/Bay Trail Project

City(ies):	**Millbrae, San Bruno, South San Francisco**
Primary Responsibility:	**Public Works of Cities Listed Above**
Right-of-Way Control:	**Cities, Caltrans, SFIA**
Required Studies/Actions:	**Feasibility Study, Design**
Cost:	**$9.5 Million**

This project addresses the gap in both the Bay Trail and general on-street connections at the San Francisco International Airport. An extensive feasibility analysis of the Bay Trail gap has been completed with a recommendation to construct a bike path (partially elevated) through the West-of-Bayshore property owned by SFIA, basically connecting the San Bruno and Millbrae Avenue interchanges. The recommended Bay Trail alignment does involve numerous expensive solutions due to the BART alignment and environmental constraints in the area. At the same time, public input at workshops identified a continued desire for an east side connection between Burlingame and South San Francisco through SFIA on McDonnell Road and Airport Access Road, regardless of the Bay Trail alignment. Bike lanes were proposed on these roads by the County prior to the current airport expansion program. A subsequent feasibility study conducted by SFIA concluded that bicycle improvements through the airport would have a variety of safety, physical, and design problems. This project would focus on evaluating the needs of commuter cyclists through this area and finding the most appropriate route that addresses their concerns about having to cross the Bayshore Freeway for north-south travel. This project would also include completing the two existing Bay Trail gaps in Burlingame.

4.4 Bicycle Parking and Other Support Facilities

A systematic program to improve the quality and increase the quantity of bicycle parking facilities is recommended in the County. The proposed performance standards that could be adopted by local jurisdictions are presented in the following recommendations.

Recommendation #1:

Bike parking should be provided at all public destinations, including parks, schools, business districts, City Halls, and other public facilities. All bicycle parking should be in a safe, secure, covered area (if possible).

Recommendation #2:

All new commercial development or redevelopment in excess of 10,000 gross leasable square feet should be required to provide one approved bicycle storage unit per 30 employees. All bicycle storage should be located in safe, secure, covered areas, be anchored to the ground, and allow bicycles to lock both frame and wheels. Figures 8 and 9 illustrate the recommended Class I (bike locker) and Class II (bike rack) configurations.

Recommendation #3:

Provide a mechanism and guidelines for the installation of bike racks on sidewalks in commercial areas and shopping centers. In general, the racks should be located in close proximity (within 200 feet) for all major generators, be visible, not obstruct pedestrian or vehicular movement, and contribute to the aesthetics of the area.

Recommendation #4:

Bicycle parking for existing non-residential uses should be implemented through one or a combination of the following two methods. (1) Require existing non-residential uses to provide bicycle parking per the requirements described above as part of the building permit process. (2) Subsidize the cost of bicycle parking through grants from public or private sources (see Funding section). Small bicycle 'U-style' racks, with capacity to hold 2-bicycles, should be provided on both sides of the streets in commercial areas at least every 200 feet.

Recommendation #5:

Bike Stations or on demand bike lockers may be appropriate at some locations in San Mateo County, such as high activity areas in downtowns and at Caltrain stations. Bike Stations are manned storage facilities that also offer repair and rental services, maps, and refreshments on a lease basis to a private operator. On demand lockers use an electronic key system that help avoid vandalism and other abuses at key locations such as BART and Caltrain stations.

Recommendation #6:

Covered, secure bicycle parking at Caltrain Stations should be a priority, with adequate capacity for peak periods. Additional bicycle storage capacity on the trains should also be explored, possibly with new or re-designed cars with additional capacity.

Recommendation #7:

A special program to construct bicycle corrals where needed at all elementary, middle, and high schools in County of San Mateo should be continued and enhanced where needed. These enclosed facilities are locked during school hours, and address the theft and vandalism concerns of students.

Recommendation #8:

A new program, required as part of event permitting, to provide and advertise and promote closed-in secure bicycle corrals at all major special events in the County and cities, to encourage residents and visitors to bicycle rather than attempt to drive should be instituted.

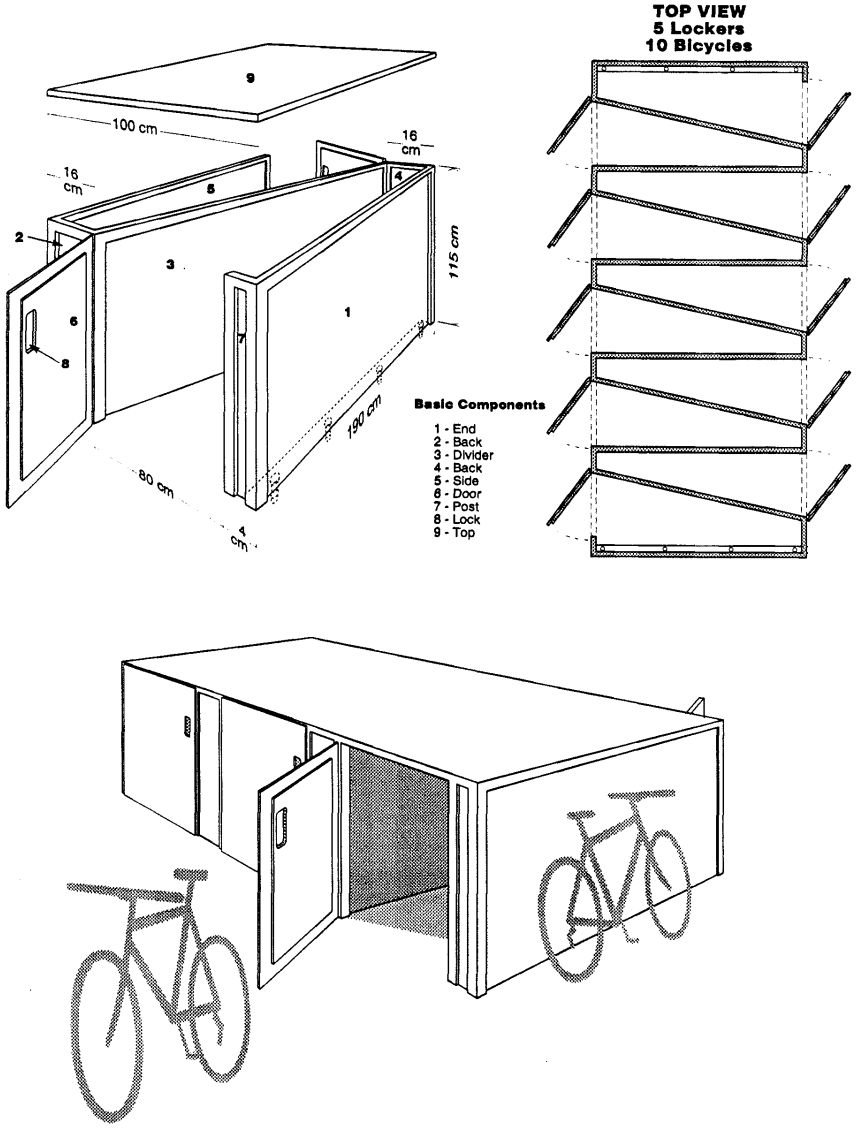


Figure 8: Class I Bike Locker Designs

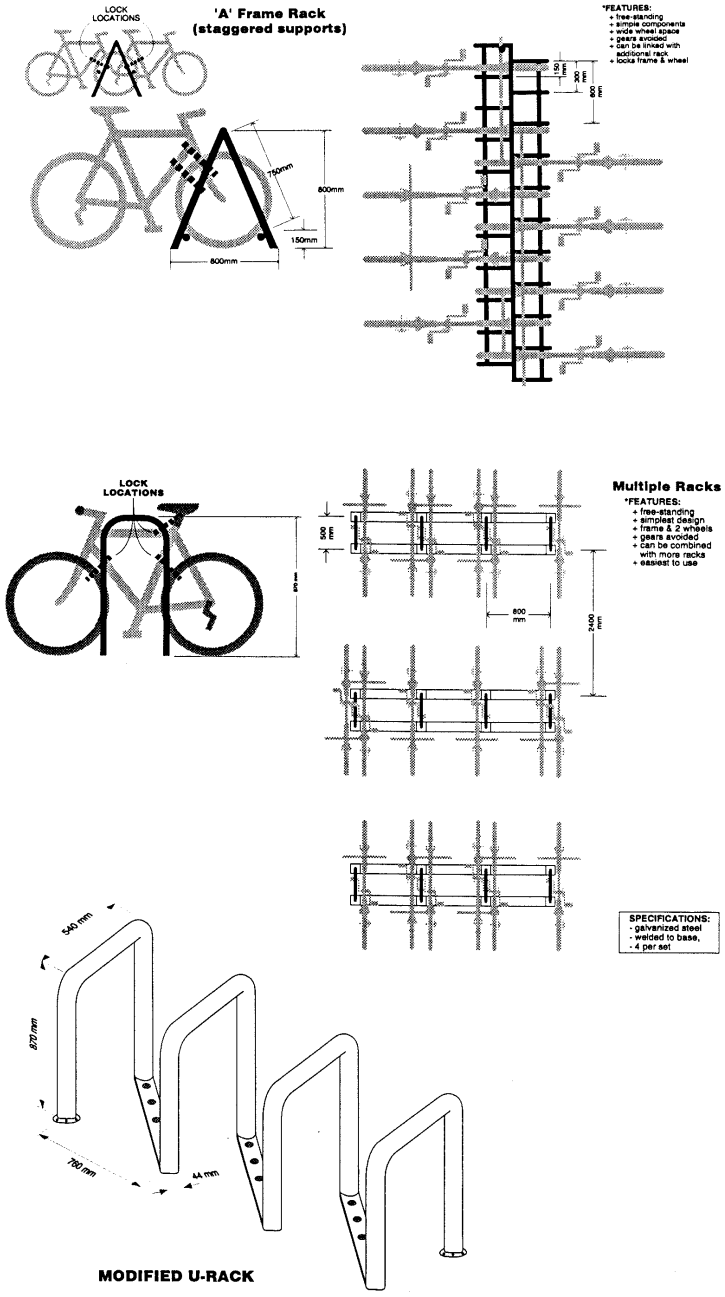


Figure 9: Class II Bike Rack Designs

4.5 Bicycle Safety Education Programs

The County of San Mateo Comprehensive Bicycle Route Plan provides both physical recommendations (such as bike lanes) and program recommendations. Some of the program recommendations, such as changes in zoning requirements for bicycle parking, have already been covered. A revised County Bicycle Transportation Map will also serve as an educational tool, providing route safety information. This section covers future efforts to educate bicyclists and motorists, and efforts to increase the use of bicycles as a transportation alternative.

4.5.1 Education

Most of the Unified School Districts, Police Departments, and Public Works within the County have a long history of trying to improve safety conditions for bicyclists. Currently, some cities such as San Mateo and Menlo Park have employed organizations such as Safe Moves to develop and implement a comprehensive traffic safety program. Unfortunately, the lack of education for bicyclists, especially younger students, continues to be a leading cause of accidents. For example, the most common type of reported bicycle accident in California involves a younger person (between 8 and 16 years of age) riding on the wrong side of the road in the evening hours. Studies of accident locations around California consistently show the greatest concentration of accidents is directly adjacent to elementary, middle, and high schools. Many less-experienced adult bicyclists are unsure how to negotiate intersections and make turns on city streets.

Motorist education on the rights of bicyclists currently includes effective cycling routes being taught in Menlo Park. Many motorists mistakenly believe, for example, that bicyclists do not have a right to ride in travel lanes and that they should be riding on sidewalks. Many motorists do not understand the concept of 'sharing the road' with bicyclists, or why a bicyclist may need to ride in a travel lane if there is no shoulder or it is full of gravel or potholes.

Existing education programs in schools are generally taught once a year to 3rd, 4th, and 5th graders. Curriculum is generally derived from established programs developed by groups such as the California State Automobile Association, and taught by members of the County of San Mateo Sheriff's Department. Budget cuts, demands on students' time, and liability concerns limit the extent of bicycle education to school children. Formal adult bicycle education is virtually non-existent. However some cities such as Menlo Park offer effective courses through their recreation department.

Recommended Program: Expand Current Education Programs

Existing educational programs in County of San Mateo schools should be expanded in a cooperative effort between the cities/County and the Unified School Districts, and supported by a secure, regular funding source. A collaboration of School District, Safety, and other Districts and Committees should be encouraged consisting of appointed parents, teachers, administrators, police, an active bicyclist, and public works staff whose task it is to identify problems and solutions, ensure implementation, and submit recommendations to the School Boards or City Councils.

Recommended Program: Develop New Educational Program Materials and Curriculum.

Education materials should be expanded to promote the benefits of bicycling, the need for education and safety improvements, the most recent educational tools available in the country (including the use of low-cost safety videos), and directives to parents on the proper school drop-off procedure for their children. Educational pamphlets for children should be made more readable. Incentive programs to reward good behavior should be developed. Educational programs, and especially on-bike training, should be expanded to more grades and for more hours per year. Education curriculum should, at a minimum, cover the following lessons:

- on-bike training or bicycle rodeos
- the use and importance of bicycle helmets
- how to adjust and maintain a bicycle
- night riding (clothes, lights)
- rules of the road
- riding on sidewalks
- how to negotiate intersections
- riding defensively
- use of hand signals

A standard safety handbook should be developed incorporating the best elements of those currently in use, and made available to each school on disk so they may be customized as needed. Each school should develop a circulation map of the campus and immediate environs to include in the handbooks, clearly showing the suggested vehicle circulation and parking patterns and explaining in text the reason behind the recommendations. This circulation map should also be a permanent feature in all school newsletters. Bicycle helmet subsidy-programs are available in California, and should be used to provide low-cost approved helmets for all school children bicyclists. An index of available handbooks, videos, curriculums, and other programs are included in the appendix of this Plan.

Recommended Program: Develop an Adult Education Program.

Establish an adult bicycle education program through the County Parks and Recreation Department and/or other City/County departments that (a) teaches adults how to ride defensively, (b) how to ride on a variety of city streets, and (c) encourages adults to feel more confident to ride to work or for recreation. Work with local bicycling groups who could provide the training expertise, and possibly lead organized bicycle training sessions, tours and rides.

Recommended Program: Educate Motorists

Educate motorists about the rights and characteristics of bicyclists through a variety of means including: (a) making bicycle safety a part of traffic school curriculum in San Mateo County schools, (b) producing a brochure on bicycle safety and laws for public distribution, (c) enforcing existing traffic laws for both motorists and bicycles, (d) sending an official letter to the

Departments of Motor Vehicles recommending the inclusion of bicycle laws in the drivers license exam, and (e) install signs that read "Share the Road" with a bicycle symbol at least every 1,000 feet along all routes of the proposed primary system where bike lanes are not feasible, travel lanes are under 14 feet wide, and ADTs exceed 10,000.

4.6 Community and Employer Outreach

Without community support, a bicycle plan lacks the key resources that are needed to ensure implementation over time. While the Public Works Departments within each of the Cities and the County may be responsible for designing and constructing physical improvements, strategies for community involvement will be important to ensure broad-based support--which translates into political support--which can help secure financial resources. Involvement by the private sector in raising awareness of the benefits of bicycling and walking range from small incremental activities by non-profit groups, to efforts by the largest employers in the County. Specific programs are described below.

4.6.1 Bicycle Donation Program

A fleet of lender bicycles available to employees to use as a commute alternative, such as the Sky Blue Try Cycle program already in place in San Mateo County, can be an effective tool. The bicycle may be purchased new or obtained from police auctions, repaired, painted and engraved with ID numbers, and made available free of charge to employees. Depending on demand, bicycles may be made available through reservations or on a rotating basis. The bicycles themselves should be lower-end, heavy-duty bicycles that have minimal re-sale value. Employer's responsibilities would be limited to an annual maintenance inspection and repairs as necessary. The objective of the program is to encourage employees to try bicycling to work as an alternative, without making a major investment. Employers may wish to allow bicycle commuters to leave 15 minutes early from work, or some other type of incentive to encourage use of the bicycles. Each of the Cities in San Mateo County could initiate their own "Yellow Bike Program" with help from C/CAG, and provide a fleet of 100 lender bicycles to commuters living within their jurisdictions.

4.6.2 Bicycle Clunker and Parts Program, Bicycle Repair Program

This program ties directly into the previous program by obtaining broken, unclaimed, or other bicycles and restoring them to working condition. The program's dual mission is also to train young people (ages 12-18) how to repair bicycles as part of a summer jobs training effort. Bicycles are an excellent medium to teach young people the fundamentals of mechanics, safety, and operation. Young people can use these skills to maintain their own bicycles, or to build on related interests. The program is often staffed by volunteers from local cycling organizations and bicycle shops, who can help build an interest in bicycling as an alternative to driving. The seed money to begin this program often comes from a local private funding source. The proposal submitted to this source should clearly outline the project objectives, operating details, costs, effectiveness evaluation, and other details. The bicycles themselves could be derived from

unclaimed stolen bicycles from the police department, or from donated bicycles. The program will need to qualify as a Section 501C(3) non-profit organization to offer tax deductions.

4.6.3 Community Adoption

Programs to have local businesses and organizations "adopt" a pathway similar to the adoption of segments of the Interstate Highway system. Supporters would be identified by small signs located along the pathway, acknowledging their contribution. Support would be in the form of an annual commitment to pay for the routine maintenance of the pathway, which in general costs about $8,500 per mile per year. Parks & Recreation or other groups may administer this program.

4.6.4 Bike Fairs and Races

The County and Cities are well positioned to capitalize on the growing interest in on-road bicycle races and criteriums. Events would need to be sponsored by local businesses, and involve some promotion, insurance, and development of adequate circuits for all levels of riders. It is not unusual for these events to draw up to 1,000 riders, which could bring some additional expenditures into the County.

The County and Cities can assist in developing these events by acting as a co-sponsor, and expediting and possibly underwriting some of the expense of--for example--police time. The County and Cities should also encourage these events to have races and tours that appeal to the less experienced cyclist. For example, in exchange for underwriting part of the costs of a race the Cities or County could require the event promoters to hold a bicycle repair and maintenance workshop for kids, short fun races for kids, and/or a tour of the route lead by experienced cyclists who could show less experienced riders how to safely negotiate city streets.

4.6.5 Bicycle Facility and Program Web Site

Web sites should be developed and linked to official city and county web pages providing the public with important information. This information should include:

A. Current bikeway maps
B. Copy of county and local bike plans
C. Bicycle parking information
D. Local bicycle groups and advisory committees
E. Safety and educational information

[Additional web site information, including examples of sites from other jurisdictions is located in the Appendix.]

In order to provide consistent and neutral sites, it is recommend that the county and cities maintain their own bicycle web sites, or agree to support a centralized web site.

4.6.6 Employer Incentives

Beyond programs described earlier such as the Bicycle Donation Program, employer incentives to encourage employees to try bicycling or walking to work include sponsoring bike fairs and races, providing bicycle lockers and shower facilities, and offering incentives to employees who commute by bicycle or walk by allowing for more flexible arrival and departure times, and possibly paying for transit or taxis during inclement weather. The County and Cities may offer incentives to employers to institute these improvements through air quality credits, lowered parking requirements, reduced traffic mitigation fees, or other means.

4.6.7 Bike-to-Work and Bike-to-School Days

In addition to the existing bike-to-work day in County of San Mateo, have local bike-to-work days on a more regular basis and in combination with other events to help promote bicycling as a commute alternative. Bike-to-work days could be sponsored by the Cities and County, possibly in conjunction with other agencies such as MTC. Bike-to-school days could be jointly sponsored with the School District, possibly in conjunction with bicycle education programs.

4.7 School Commute Improvements

Local bicycle improvements needed to school commute corridors vary from community to community. Parents in many communities are reluctant to let their children ride to school out of safety concerns. Unfortunately, this has resulted in additional traffic on local roads and especially near schools which has increased the very safety concerns many parents have. Schools and local communities may embark on an evaluation of their school commute route by taking the following steps:

A. Form a School Commute or Safety Committee, formed of parents and representatives from the school, local public works department, and the police department. Set objectives and a regular meeting schedule.
B. Conduct a review of existing materials and conditions, including crash/accident data related to bicyclists for the past three years, condition of streets, sidewalks, and crosswalks. Conduct research into what other communities have done, and the research being conducted on a state and national level.
C. Hold a public meeting to address school commuting. Record comments. Ask people to fill out a survey and to record on a map the routes they typically use to get to school.
D. Major constraints in the school commute routes will become apparent through the data collection, field review, and public input process. Ask the public works and police staff for their input into reasonable solutions.
E. Common types of improvements include (a) maps and educational materials to parents and school children, (b) crossing guards, (c) helmet training programs for students, (d) new designs or restrictions in the school drop off area, (e) new or enhanced bike lanes and sidewalks, (f) new or enhanced crosswalks including enhanced signing and lighting, and (g) instituting a ‘walking school bus’ system where parents take turns walking children along established routes.
F. Identify and prioritize improvements in conjunction with local public works department. Identify phased costs and funding needs. Request local matching funds from your local

government, and assist local staff in pursuing outside funding as needed. Be sure and have a presence at all Council meetings to demonstrate the public support for such improvements.

4.8 General Planning Recommendations

In order to develop a comprehensive local bikeway system within the countywide system, cities and local agencies should develop and maintain bike plans that comply with the State Bicycle Transportation Act, and meet state funding requirements. By adopting this plan, routes shown on this plan would meet State funding requirements. Cities would need to complete their own Bike Plans for local bikeways not shown in this plan.

5.0 Design and Maintenance Standards

This chapter provides details on the recommended design and operating standards for the San Mateo County Bikeway System.

5.1 Existing Bicycle Design Standards and Classifications

The American Association of State Highway and Transportation Officials (AASHTO) and the California Department of Transportation (Caltrans) have developed national design standards for bikeways. The Caltrans Highway Design Manual, Chapter 1000: Bikeway Planning and Design, serves as the official design standard for all bicycle facilities in California. Design standards in Chapter 1000 fall into two categories, mandatory and advisory. Caltrans advises that all standards in Chapter 1000 are followed, which also provides a measure of design immunity to the City. If proposed signs do not meet current Caltrans standards, the plan recommends submitting them to Caltrans for review and approval prior to implementation. Not all possible design options are shown in Chapter 1000. For example, intersections, ramp entrances, rural roads, and a variety of pathway locations are not specified in the Caltrans Highway Design Manual.

5.2 General Design Recommendations

5.2.1 Conform to Caltrans and Other Appropriate Design Guidelines for All Bikeways

All designated Class I, II, or III bicycle facilities should conform to the Caltrans Highway Design Manual Chapter. As stated in the Highway Design Manual (p. 80-1): The design standards used for any project should equal or exceed the minimum given in the Manual to the maximum extent feasible, taking into account costs, traffic volumes, traffic and safety benefits, right of way, socioeconomic and environmental impacts, etc. This philosophy provides for use of lower standards when such use best satisfies the concerns of the given situation. Because design standards have evolved over many years, many existing highways do not conform fully with current standards. It is not intended that current manual standards be applied retroactively to existing streets and highways; such is neither warranted nor economically feasible. Design Exceptions shall be per City Engineer which is in accordance with Caltrans Local Assistance Procedures Manual s section for Plans, Specifications & Estimates.

San Mateo County's 20 cities encompass a range of topography from the low-lying bay flats to the coastal hills. Most of the cities' street networks are already developed, with new infill development constrained by the topography. Design exceptions are anticipated in the already developed urbanized areas for gap closures. In the new and redevelopment areas, the design of facilities should be based on the general principals outlined in the Highway Design Manual, plus other sources such as

- the U.S. Department of Transportation, Federal Highway Administration (Implementing Bicycle Improvements at the Local Level),
- the Bicycle Compatibility Index: A Level of Service Concept,

- Implementation Manual, Selecting Roadway Design Treatments to Accommodate Bicycles, Manual on Uniform Traffic Control Devices,
- American Association of State Highway Transportation Officials (A Policy on Geometric Design of Highways and Streets),
- Transportation Research Board (Highway Capacity Manual),
- Institute of Transportation Engineers (Transportation Engineering Handbook), and
- Uniform Vehicle Code.

A licensed traffic and/or civil engineer shall approve final design.

5.3 Class I, II and III Bikeway Design Guidelines

The following general planning and design practices are recommended for implementing bikeways in San Mateo County:

1. Bike lanes should be considered on all streets identified as part of county bikeway system in this plan. Streets with 5,000 or fewer average daily traffic (ADTs) may not warrant bike lanes, and should be signed Class III Bike Routes.
2. Bike lanes should always be provided on both sides of two-way streets. Bike lanes should be placed on the far right side of both one-way street pairs. Contra-flow bike lanes may be provided on one-way streets, separated by at least 5 feet or with a physical barrier.
3. Bike paths that are parallel to streets are not desirable if they are short segments (less then one mile.) or if there are numerous side streets or driveways with limited visibility.
4. When evaluating street for possible bike lanes, curb-to-curb widths, ADT volumes, 85th percentile traffic speeds, and parking occupancy data should be collected.
5. If bike lanes will not fit with current striping, the following steps may be taken:
   A. Reduce travel lanes to 10 feet on streets with under 5,000 ADT volumes.
   B. Reduce travel lanes to 11 feet on streets with under 10,000 ADT volumes.
   C. Reduce travel lanes to 11.5 feet on streets under 15,000 ADT volumes.
   D. Reduce parking lanes to 8 feet; eliminate lane if peak occupancy (night time for residential, day time for commercial) is under 20%. Day time parking prohibitions may be considered in residential areas for combination parking/bike lanes.
   E. Consider reducing or eliminating center and turn lanes based on actual usage.
   F. Eliminate travel lanes on corridors where the capacity is not required. Default lane complicates for corridors with infrequent traffic signals is 1,800 vehicles per lane per hour (vplph). Travel lanes may be added and dropped at signalized intersections there corridors. Default lane capacitates for capacities for corridors with frequent traffic signals ranger between 600 and 1,200 vplph, depending on timing.
   G. Fog lines or shoulder stripping can be placed on Class III bike routes, along with appropriate signing.
   H. Where bike lanes cannot be provided, curb lanes should be a minimum of 12 feet and preferably 14 feet.
   I. On roads with steep terrain, a climbing (up hill) lane 2-4 feet wide may be approprate

solution, along with intermittent turnouts.

The following guidelines present the recommended minimum design standards and ancillary support items for Class I bike paths (also referred to as multi-use trails), Class II bike lanes, and Class III bike routes.

5.3.1 All Class I bike paths should generally conform to the design recommendations in Table 2 and Figure 1.

1. Multi-use trails and unpaved facilities that serve primarily a recreation rather than a transportation function and will not be funded with federal transportation dollars do not need to be designed to Caltrans standards.

2. Class I bike path crossings of roadways require preliminary design review. A prototype design is presented in Figure 11. Generally speaking, bike paths that cross roadways with ADTs over 20,000 vehicles will require signalization or grade separation

3. Landscaping should generally be low water native vegetation.

4. Lighting should be provided where commuters will use the bike path.

5. Barriers at pathway entrances should be clearly marked with reflectors and ADA accessible (min. 5 feet clearance).

6. Bike path construction should take into account impacts of maintenance and emergency vehicles on shoulders and vertical requirements.

7. Provide adequate trailhead parking and other facilities such as restrooms, drinking fountains (at appropriate locations).

Table 9: Class I Bicycle Path Specifications

Pavement Type:	Recycled Asphalt	3"	Thickness	(75 mm)
	Asphalt[1]	3"	Thickness	(75 mm)
	Concrete[2]	3"	Thickness	(75 mm)
Sub-Base:	Granite	4-6"	Thickness	(100-150 mm)
	Gravel	4-6"	Thickness	(100-150 mm)
Shoulders:	Decomposed Granite	2-4"	Thickness	(50-100 mm)
Width:	Minimum 1-way Path	5'	Width	(1.5 m)
	Minimum 2-way Path	10'	Width	(3.1 m)
	Preferred 2-way Path	12-15'	Width	(3.6-4.6 m)
Shoulders:		2-3'	Width	(0.6-1.0 m)
Lateral Clearance:		2-3'	Width	(0.6-1.0 m)
Vertical Clearance:		8-10'	Height	(2.5-3.0 m)
w/Equestrians		12'	Height	(3.6 m)
Striping:				
Centerline (none, dashed yellow, solid yellow)		4"	Width	(100 mm)
Edgeline (none or solid white)		4"	Width	(100 mm)
Signing:	(See Caltrans Traffic Manual and MUTCD)			
Minimum Cross Slope:		2%	2%	
Minimum Separation from Roadway:[3]		5'	(1.5 m)	
Design Speed:		20-30 mph	(40-50 kph)	
Maximum Super Elevation:		5%	5%	
Maximum Grades (over 100'):		5%	5%	
Removable Bollards (minimum spacing):		5'	(1.5 m)	
Lighting (if night use is expected):		5-22 LUX	5-22 LUX	

Source: (Caltrans Highway Design Manual, Chapter 1000)

[1] Asphalt may be unsuitable for bike paths in stream channels due to asphalt oils. Concrete paving is recommended in areas where the trail is subject to regular water flow.

[2] A 6" concrete thickness may be use directly on compacted native material.

[3] Unless a physical barrier is provided.

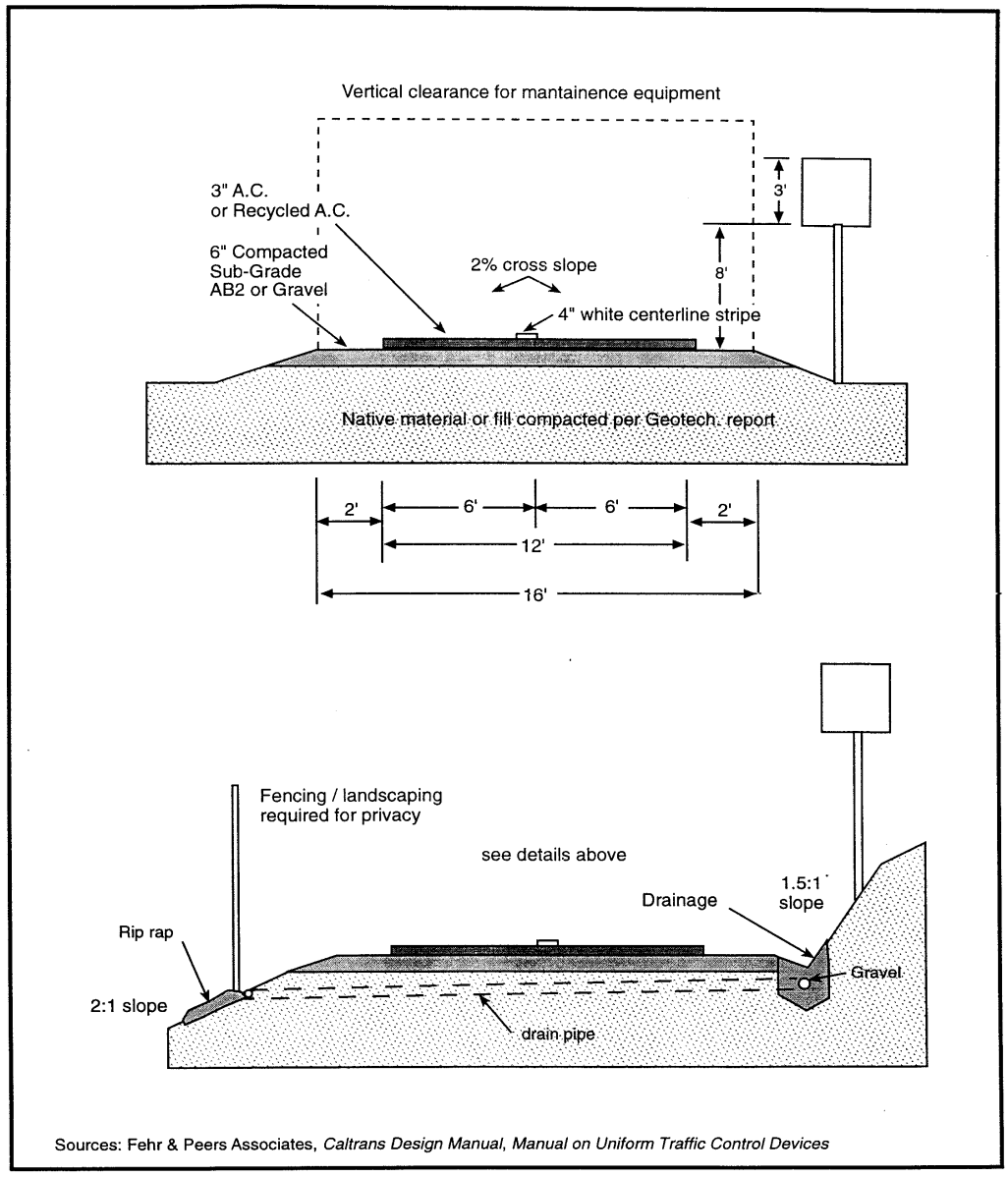


Figure 10: Class I Bicycle Path Cross Section

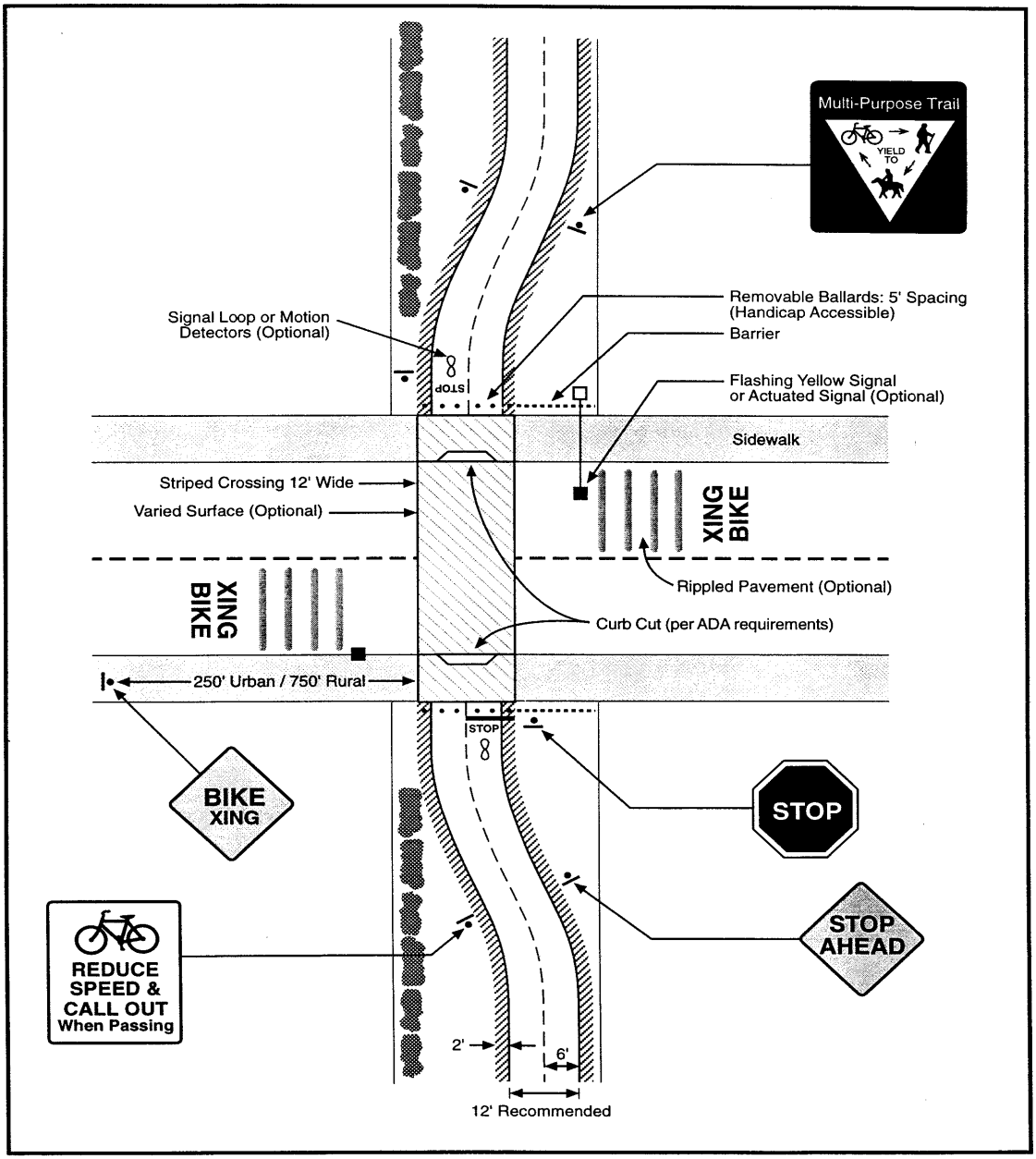


Figure 11: Class I Bicycle Path Crossing Prototype

5.3.2: All Class II bike lanes should generally conform to the design recommendations in Table 4 and Figure 1.

1. Intersection and interchange treatment. Caltrans provides recommended intersection treatments in Chapter 1000 including bike lane "pockets" and signal loop detectors. The Department of Public Works should develop a protocol for the application of these recommendations, so that improvements can be funded and made as part of regular improvement projects. Figure 11 (Class II Bike Lanes at Intersections) and Figure 10 (Recommended Right Turn Channelization) provides details for recommended intersection treatments.

   The San Mateo County Bike Plan recommends feasibility studies for safety and access improvements to five key interchanges on proposed or existing bikeways. These interchanges are Willow Rd, Ralston/101, Ralston/ECR, East Hillsdale, 4th Avenue, and Broadway. At each of these intersections, bicyclists and pedestrians face significant traffic volumes, speeds, and turning movements. Figures 12 through 14 provide examples of potential interchange improvements that should be considered:

   - Option 1 (Figure 12): Reconfigure Key Ramp Entrances: This option would reduce the curb radius at ramp intersection points and provide new crosswalks and signs warning motorists of potential conflicts.
   - Option 2 (Figure 13): Partial Reconfiguration. This option would eliminate, in part, the cloverleaf style interchange design.
   - Option 3 (Figure 14): New Bike/Ped Bridge or Undercrossing. This option would build separate bridges or undercrossings, effectively re-routing cyclists from the conflict areas.
   - Option 4: Complete Interchange Reconstruction. This option would completely rebuild the intersections to eliminate the cloverleaf-style interchange design, eliminating many of the conflict points.

   Each of these options has advantages and disadvantages from an auto capacity standpoint. The Plan recommends a feasibility study be conducted at each location that considers traffic capacity and bicycle/pedestrian mobility to further develop these options.

2. Signal loop detectors capable of detecting bicycles should be considered for all intersections with vehicle detection. Bicycle capable signal detectors should be installed in all turn lanes as appropriate. The location of the detectors should be identified by the Caltrans approved bicycle loop detector stencil. Signal detectors should be installed in bicycle lanes wherever possible.

3. Bike lane pockets (min. 4' wide) between right turn lanes and through lanes should be provided wherever available width allows, and right turn volumes exceed 150 motor vehicles/hour.

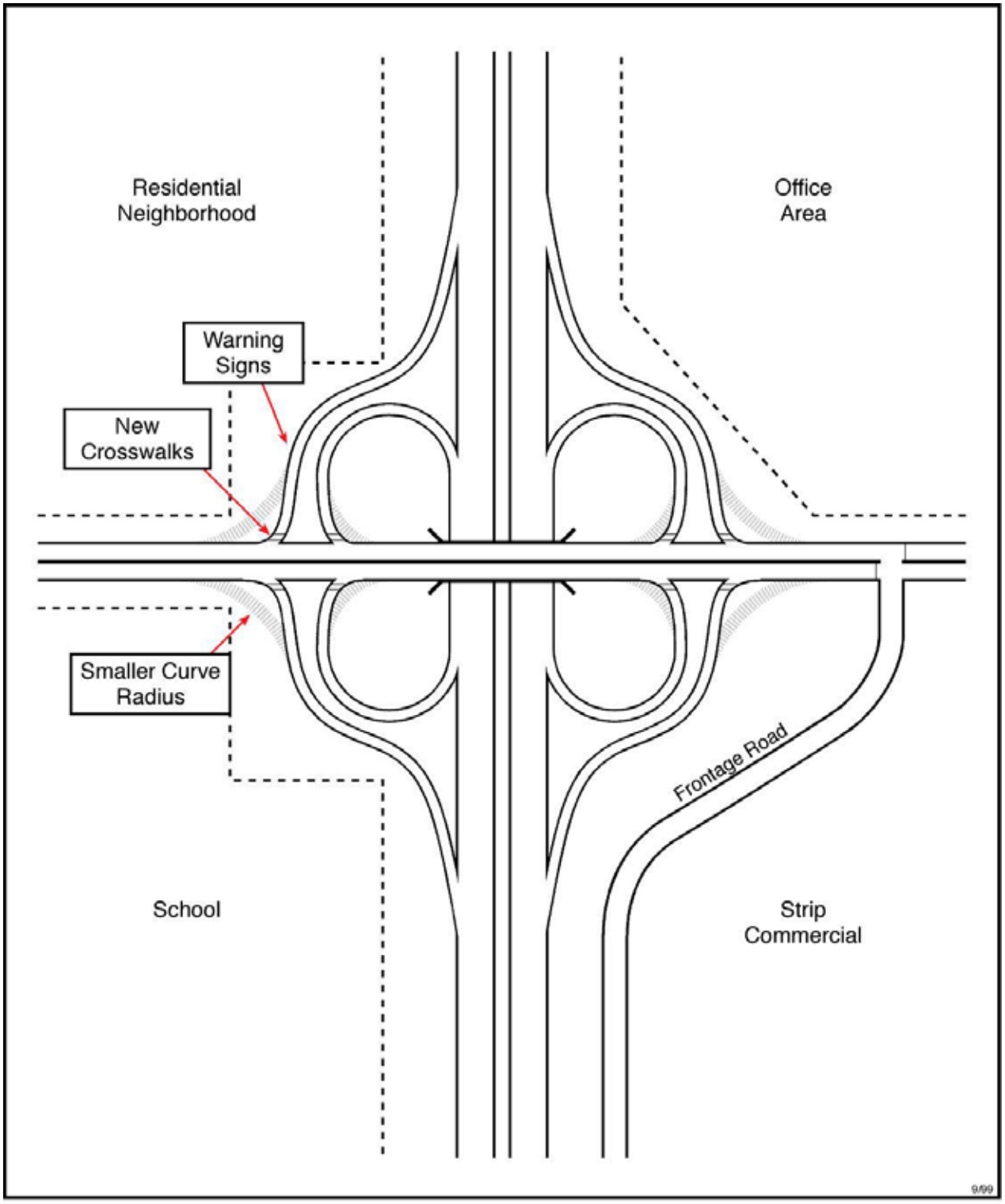


Figure 12

OPTION ONE
RECONFIGURE KEY RAMP ENTRANCES

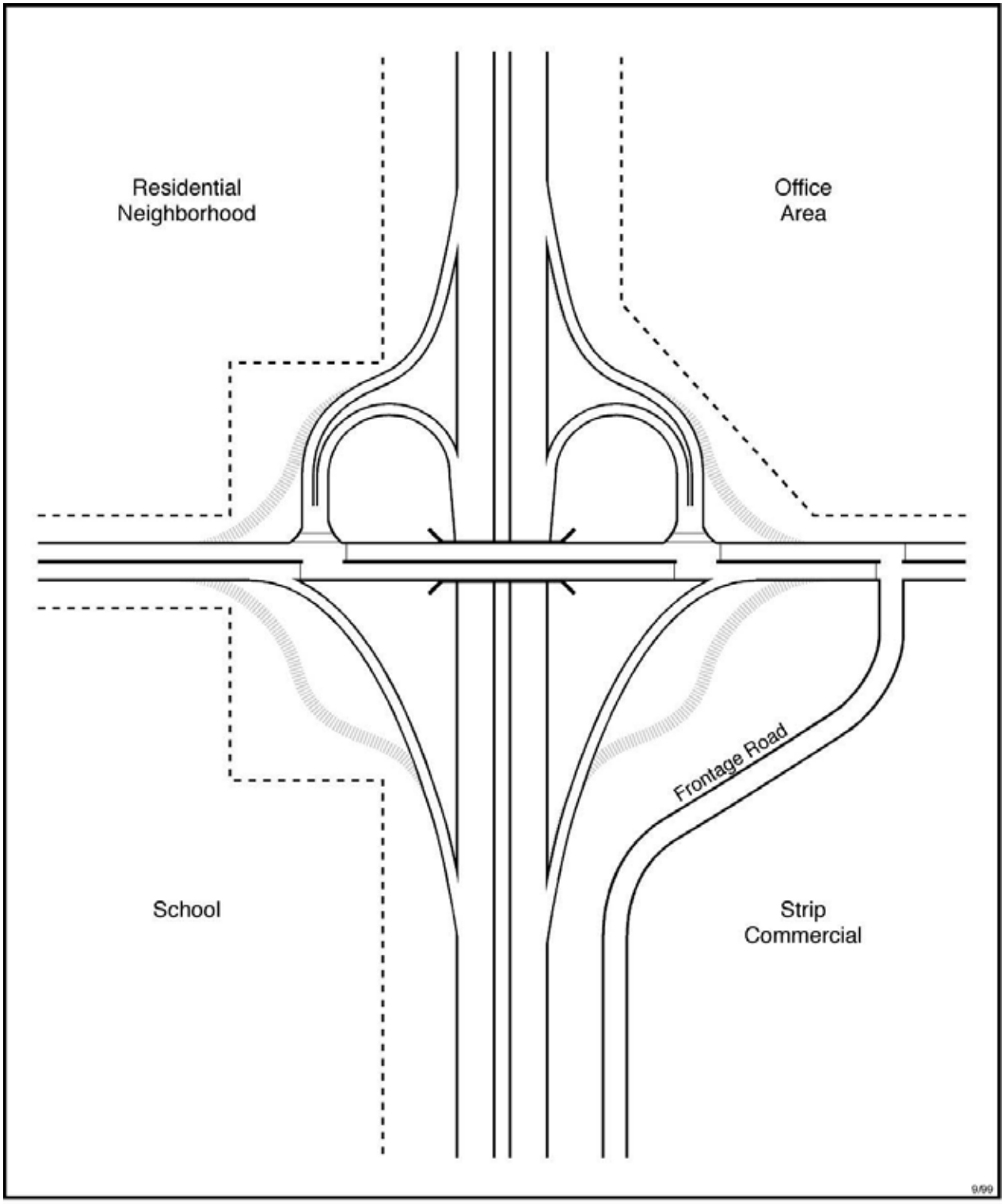


Figure 13

OPTION TWO
PARTIAL RECONFIGURATION

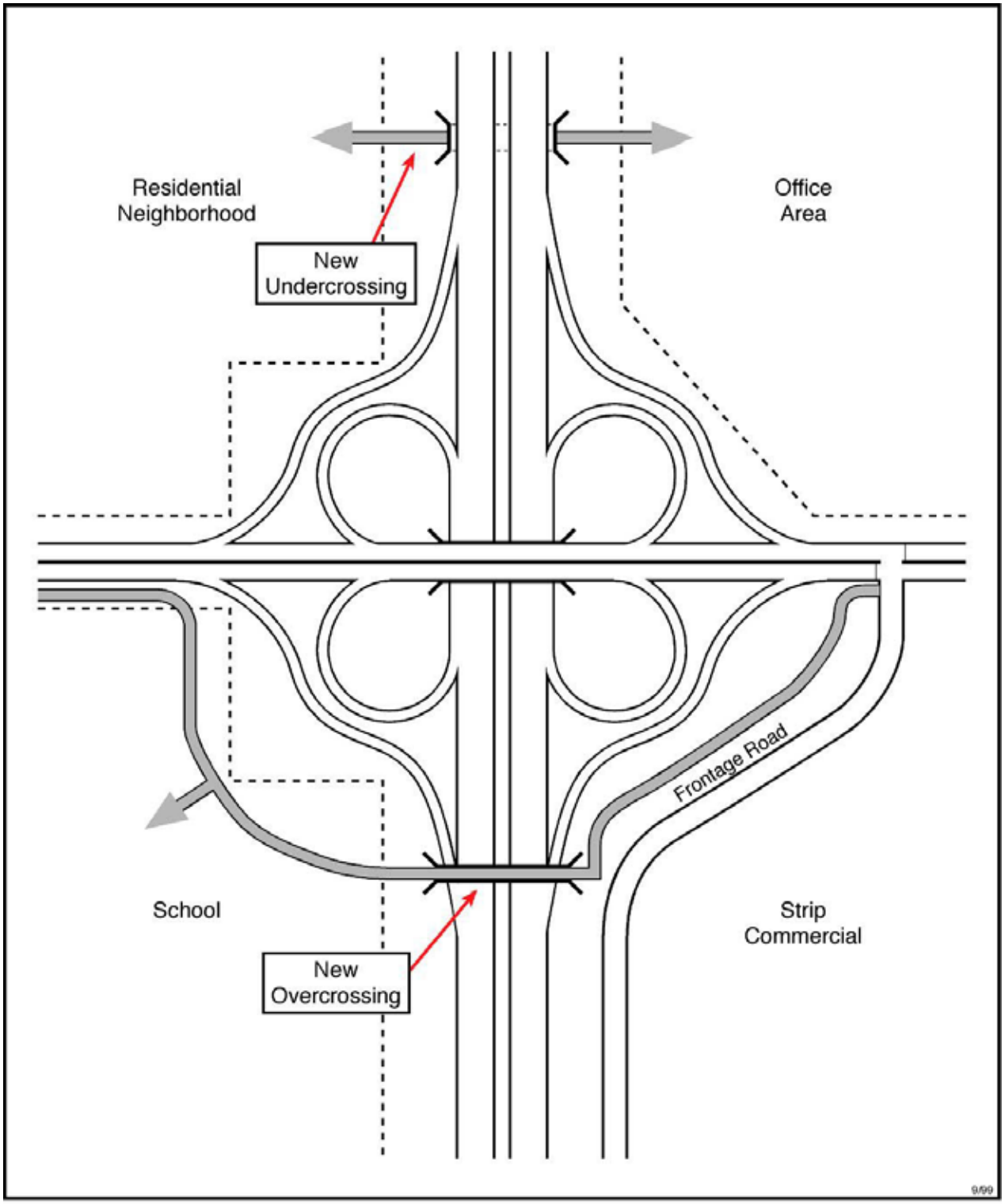


Figure 14

OPTION THREE
NEW BIKE / PED BRIDGE OR UNDERCROSSING

5.4 Other Facilities

In addition to those identified by Caltrans, there are a variety of improvements that will enhance the safety and attraction of streets for bicyclists.

Bicycle Boulevards. Palo Alto pioneered the concept of a bicycle boulevard—a street directly parallel to a major commercial corridor designed to promote bicycle movement and discourage through vehicle movement. This was achieved by partial street closures and lack of coordinated signals. In addition, traffic calming treatments, such as speed bumps and traffic circles, can help reduce auto speeds and volumes, while frequent signing as a "Bicycle Boulevard" helps increase the motorists' awareness. A bicycle boulevard treatment may be appropriate to enhance street safety and usability and to create a viable alternative route for bicyclists where the parallel major street is unattractive.

Sidewalks. The use of sidewalks as bicycle facilities is not encouraged by Caltrans, even as a Class III bike route. There are exceptions to this rule. The California Vehicle Code states: "Local authorities may adopt rules and regulations by ordinance or resolution regarding the (...) operation of bicycles (...) on the public sidewalks." (CA VC 21100, Subdiv. H). Caltrans adds in Chapter 1000: "In residential areas, sidewalk riding by young children too inexperienced to ride in the street is common. With lower bicycle speeds and lower auto speeds, potential conflicts are somewhat lessened, but still exist. But it is inappropriate to sign these facilities as bikeways. Bicyclists should not be encouraged (through signing) to ride facilities that are not designed to accommodate bicycle travel.

5.4.1: Adopt Caltrans recommendations.

5.5 Other Design Guidelines

Traffic Calming. This includes any effort to moderate or reduce vehicle speeds and/or volumes on streets where traffic has a negative impact on bicycle or pedestrian movement. Because these efforts may impact traffic outside the immediate corridor, study of traffic impacts is typically required. For example, the City of Berkeley instituted traffic calming techniques by blocking access into residential streets. The impact was less traffic on local streets, and more traffic on arterials and collectors. Other techniques include installing traffic circles, intersection islands, partial street closings, "bulb-out" curbs, pavement treatments, lower speed signal timing, and narrowing travel lanes. Traffic circles, roundabouts, and other measures may be considered for residential collector streets where there is a desire to control travel speeds and traffic volumes but not to install numerous stop signs or traffic signals.

Table 10: Class II Bike Lane Specifications

Minimum Widths	Adjacent Parking	5’	(1.5m)
	No Parking[4]	4’	(1.2m)
	Combination Parking Lane[5]	11-13’	(1.2m)
Striping	Left side line: solid white stripe	6”	(150mm)
	Right side line: solid white stripe	4”	(100mm)
	Approach to intersections: Dashed white stripe	100-200’	(30m-60m)

Signing R81 Bike Lane Sign

- beginning of all bike lanes
- far side of all bike path crossings
- at approaches and far side of all arterial crossings
- at major changes in direction
- maximum ½ mile (0.8km) intervals

Custom Bike Route Sign with G33 Directional Arrow and destination signs (where needed)

- see items under R81 Bike Lane Sign
- at approach to arterial crossings

Pavement Markings “Bike” legend
“Lane” legend
Directional arrow

- see items under R81 Bike Lane Sign
- at beginning and end of bike lane pockets at approach to intersection

Source: Caltrans Highway Design Manual, Chapter 1000, MUTCD, Caltrans Traffic Manual

4 Minimum 3’ (.9m) between stripe and gutter joint.
5 Rolled curb 11’ (3.3m), vertical curb, 12’ (3.6m), 13’ (3.9m) recommended with significant parking or turnover.

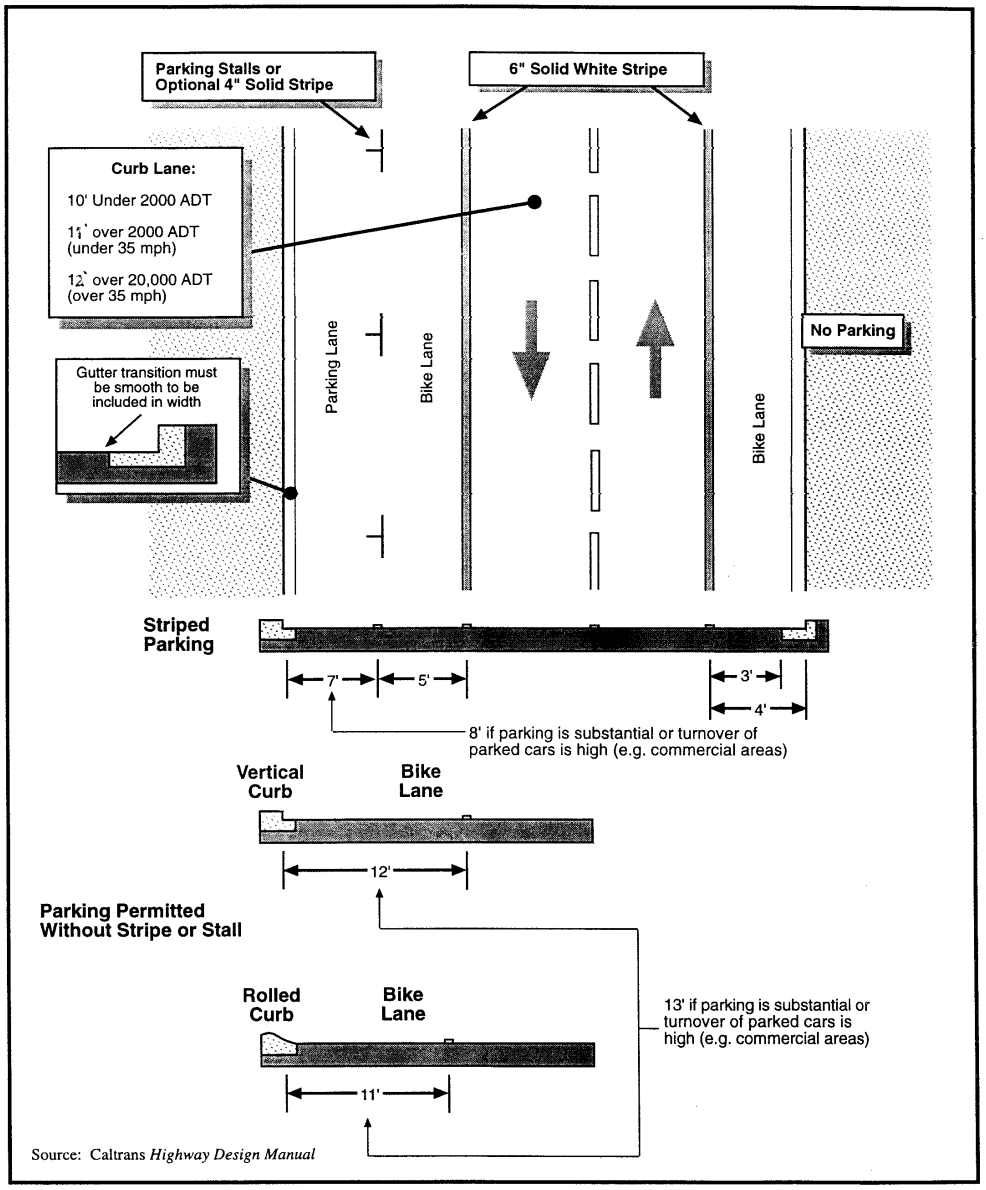


Figure 15: Class II Bike Lane Cross Section

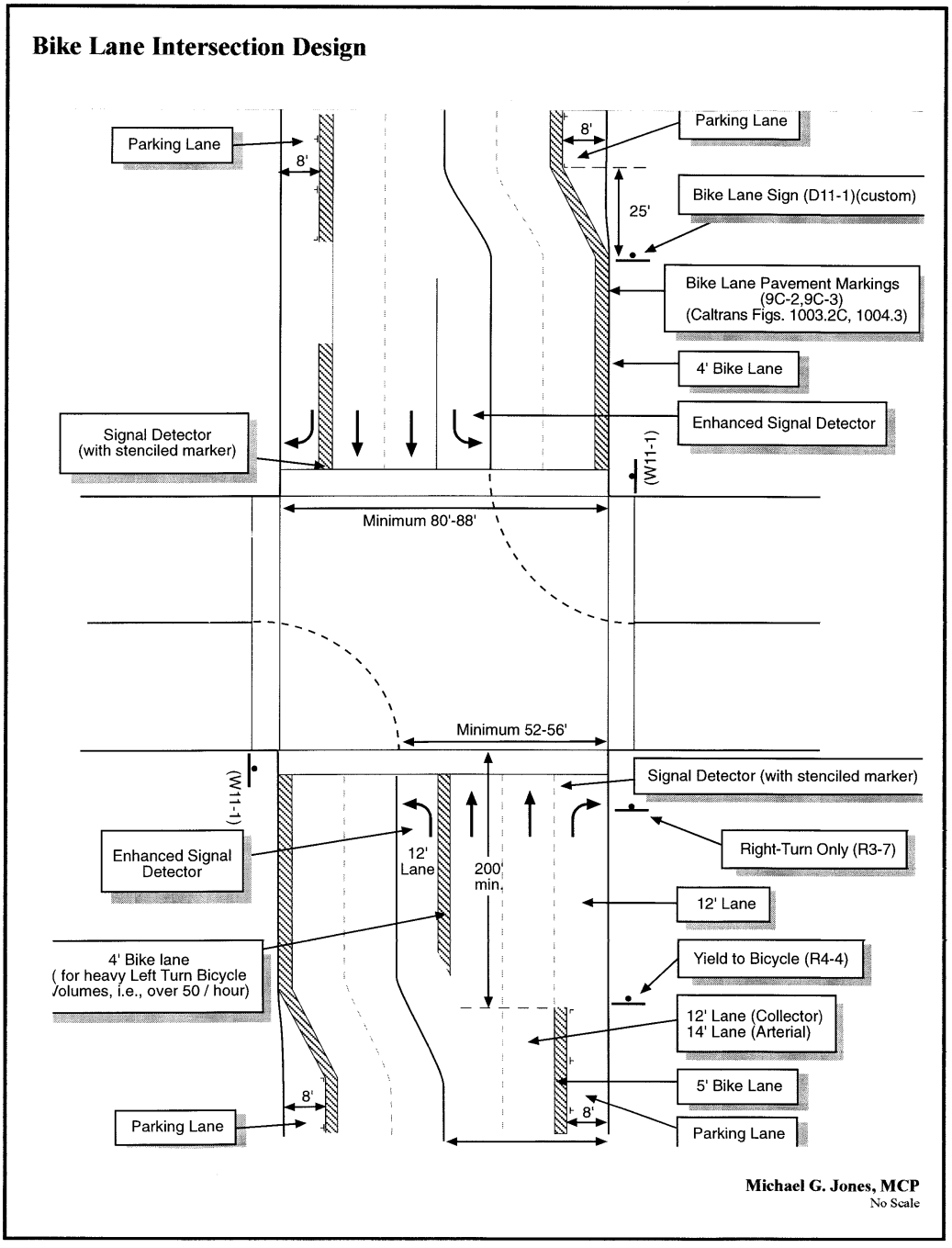


Figure 16: Bike Lane Intersection Design

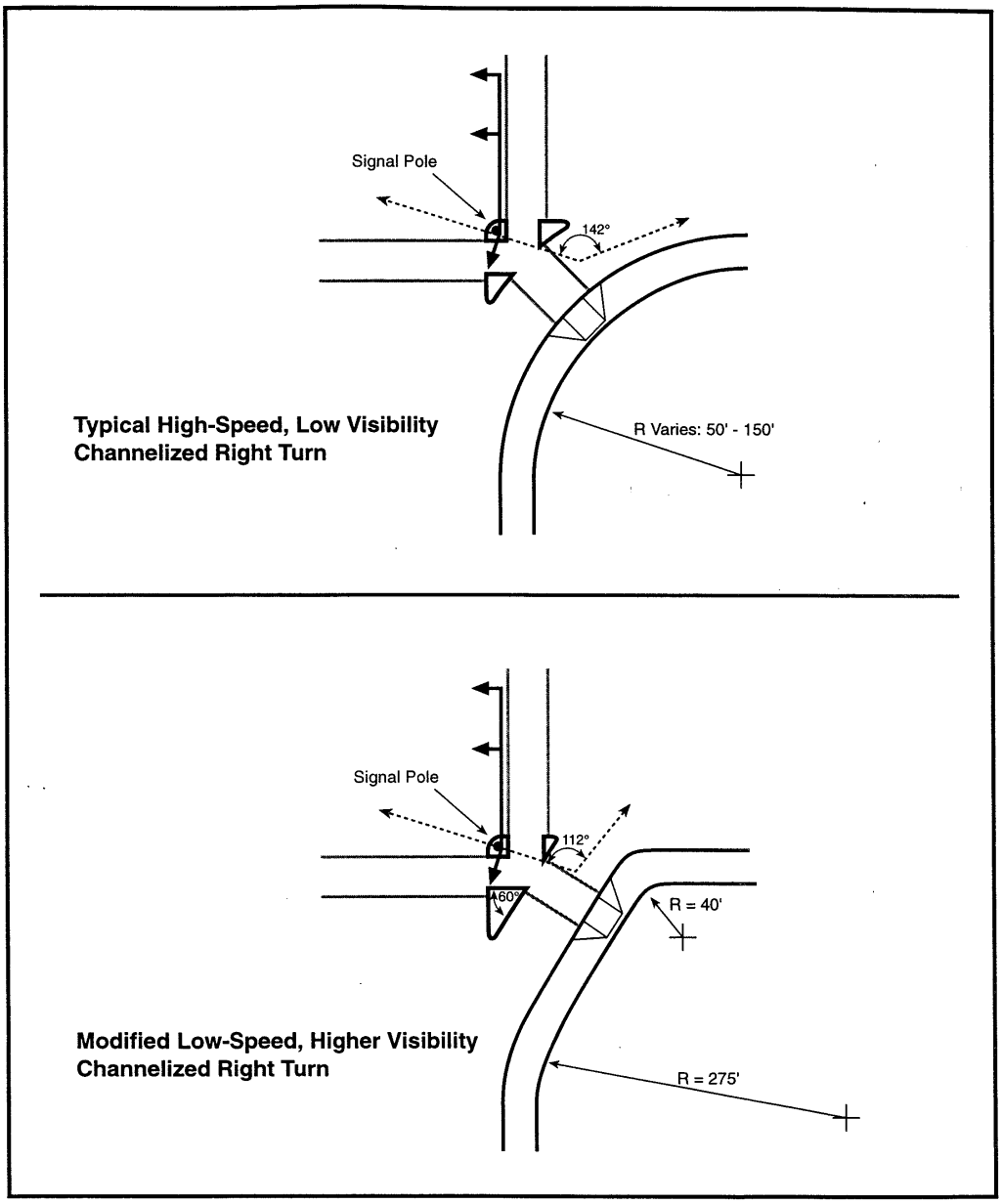


Figure 17: Recommended Right Turn Channelization

Signing, Striping, and Signalization. All bikeway signing in San Mateo County should conform to the signing identified in the Caltrans Traffic Manual and/or the Manual on Uniform Traffic Control Devices (MUTCD). These documents give specific information on the type and location of signing for the primary bike system. A list of bikeway signs from Caltrans and the MUTCD are shown in Table 6 (List of Bikeway Signs). Typical signing for a school commute corridor is shown in Figure 19. A typical bike route sign is shown in Figure 20.

5.5.1 Develop a San Mateo County Bikeway System logo for use on the primary network. This sign should include a bikeway numbering system that is keyed into a publicly produced bikeway map. A suggested numbering system is shown in the appendix. Examples of Caltrans-approved bicycle route number signs with potential route names and destinations are shown in Fig. 20.

5.5.2: Installing bikeway signs should be a high priority, and may begin immediately on Class III bike route portions of the bikeway network. Examples of bikeway signing at signalized and unsignalized intersections is shown in Figures 21 and 22. Examples of bikeway warning signs are shown in Figure 23.

5.5.3: The County and cities should work to identify locations where centralized public covered bicycle parking is most needed and can be installed, such as parking lots and garages. These facilities may charge a small user fee and/or be subsidized by nearby employers.

Table 11: Recommended Signing and Marking

Item	Location	Color	Caltrans Designation	MUTCD Designation
No Motor Vehicles	Entrances to trail	B on W	R44A	R5-3
Use Ped Signal/Yield to Peds	At crosswalks; where sidewalks are being used	B on W	N/A	R9-5 R9-6
Bike Lane Ahead: Right Lane Bikes Only	At beginning of bike lanes	B on W	N/A	R3-16 R3-17
STOP, YIELD	At trail intersections with roads and Coastal Bikeways	W on R	R1-2	R1-1 R1-2
Bicycle Crossing	For motorists at trail crossings	B on Y	W79	W11-1
Bike Lane	At the far side of all arterial intersections	B on W	R81	D11-1
Hazardous Condition	Slippery or rough pavement	B on Y	W42	W8-10
Turns and Curves	At turns and curves which exceed 20 mph design specifications	B on Y	W1,2,3 W4,5,6,14 W56,57	W1-1,2 W1-4,5 W1-6
Trail Intersections	At trail intersections where no STOP or YIELD required, or sight lines limited	B on Y	W7,8,9	W2-1, W2-2 W2-3, W2-3 W2-4, W2-5
STOP Ahead	Where STOP sign is obscured	B,R on Y	W17	W3-1
Signal Ahead	Where signal is obscured	B,R,G	YW41	W3-3
Bikeway Narrows	Where bikeway width narrows or is below 8'	B on Y	W15	W5-4
Downgrade	Where sustained bikeway gradient is above 5%	B on Y	W29	W7-5
Pedestrian Crossing	Where pedestrian walkway crosses trail	B on Y	W54	W11A-2
Restricted Vertical Clearance	Where vertical clearance is less than 8'6"	B on Y	W47	W11A-2

Table 11 (cont'd): Recommended Signing and Marking				
Railroad Crossing	Where trail crosses railway tracks at grade	B on Y	W47	W10-1
Directional Signs (i.e. U.C. Davis, Downtown, Train Station, etc.	At intersections where access to major destinations is available	W on G	G7 G8	D1-1b(r/l) D1-1c
Right Lane Must Turn Right; Begin Right Turn Here, Yield to Bikes	Where bike lanes end before intersection	B on W	R18	R3-7 R4-4
Dixon-Davis Bikeway	Trail logo: at all trail entrances, major intersections, major access points	Varies	n/a	n/a
Trail Regulations	All trail entrances	B on W	n/a	n/a
Multi-purpose Trail: Bikes Yield to Pedestrians	All trail entrances	n/a	n/a	n/a
Bikes Reduce Speed & Call Out Before Passing	Every 2,000 feet	B on W	n/a	n/a
Please Stay On Trail	In environmentally-sensitive areas	n/a	n/a	n/a
Caution: Storm Damaged Trail	Storm damaged locations	B on Y	n/a	n/a
Trail Closed: No Entry Until Made Accessible & Safe for Public Use	Where trail or access points closed due to hazardous conditions	n/a	n/a	n/a
Speed Limit Signs	Near trail entrances: where speed limits should be reduced from 20 mph	B on W	n/a	n/a
Trail Curfew 10PM - 5AM	Based on local ordinance	R on W	n/a	n/a

B – Black
W – White
R – Red
Y – Yellow
G - Green

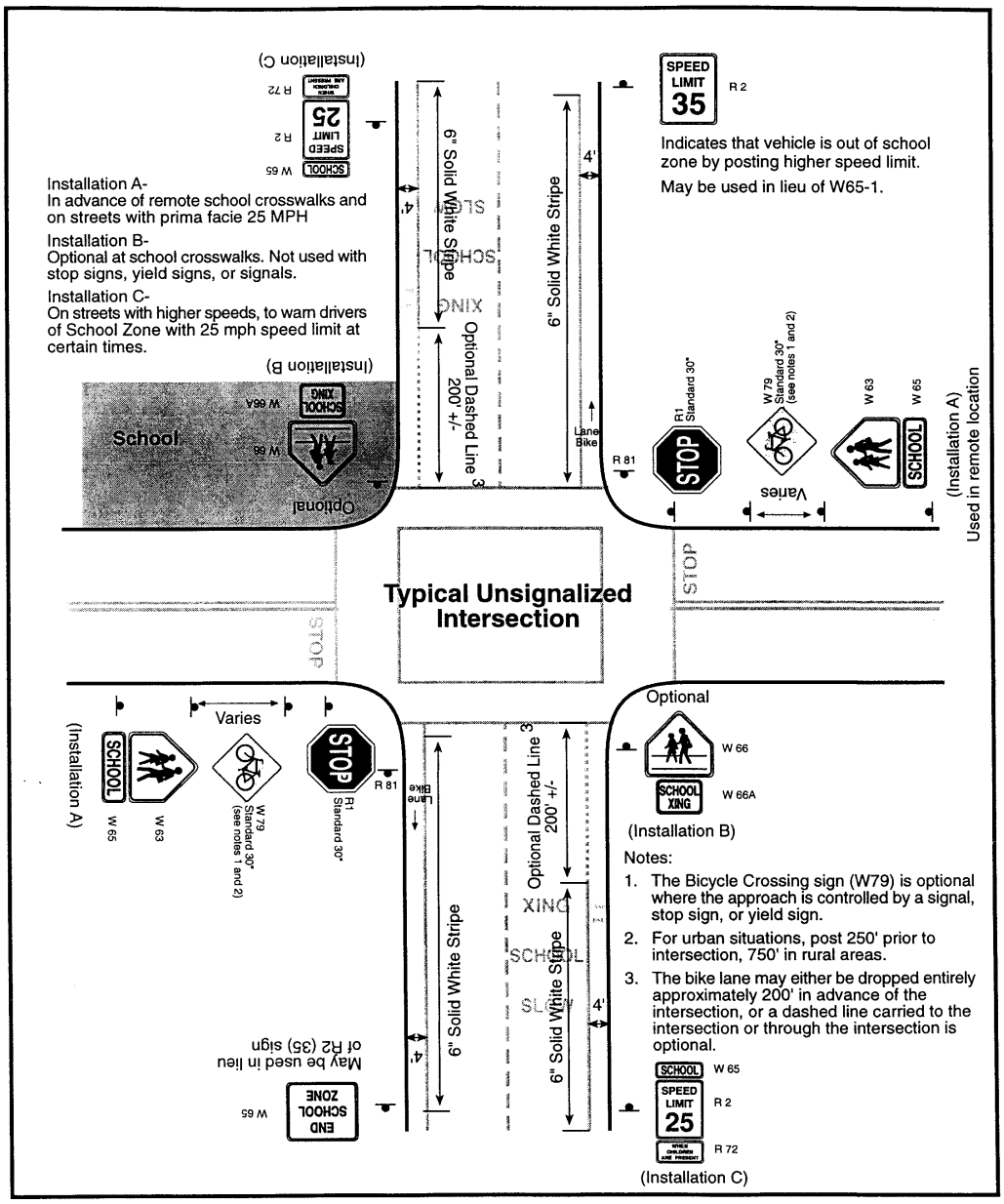
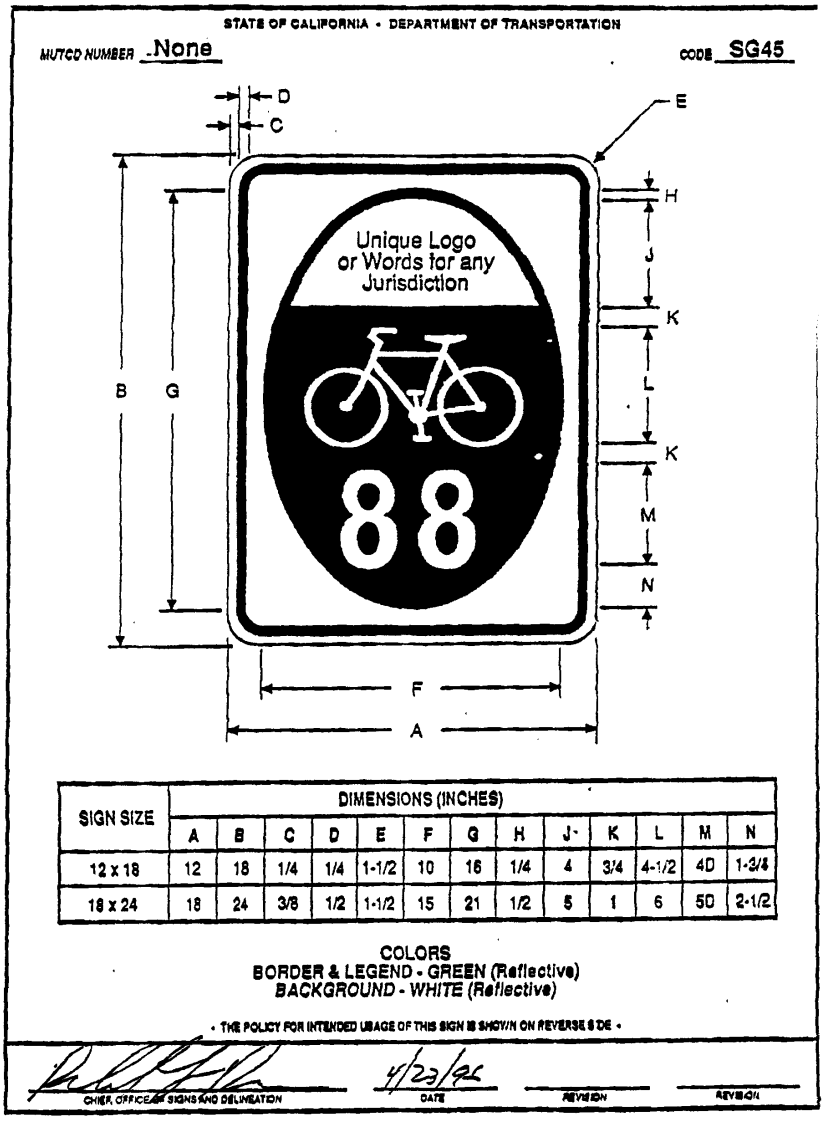


Figure 18: Signs and Marking within School Zones


BIKE ROUTE

Figure 19: Bike Route Sign



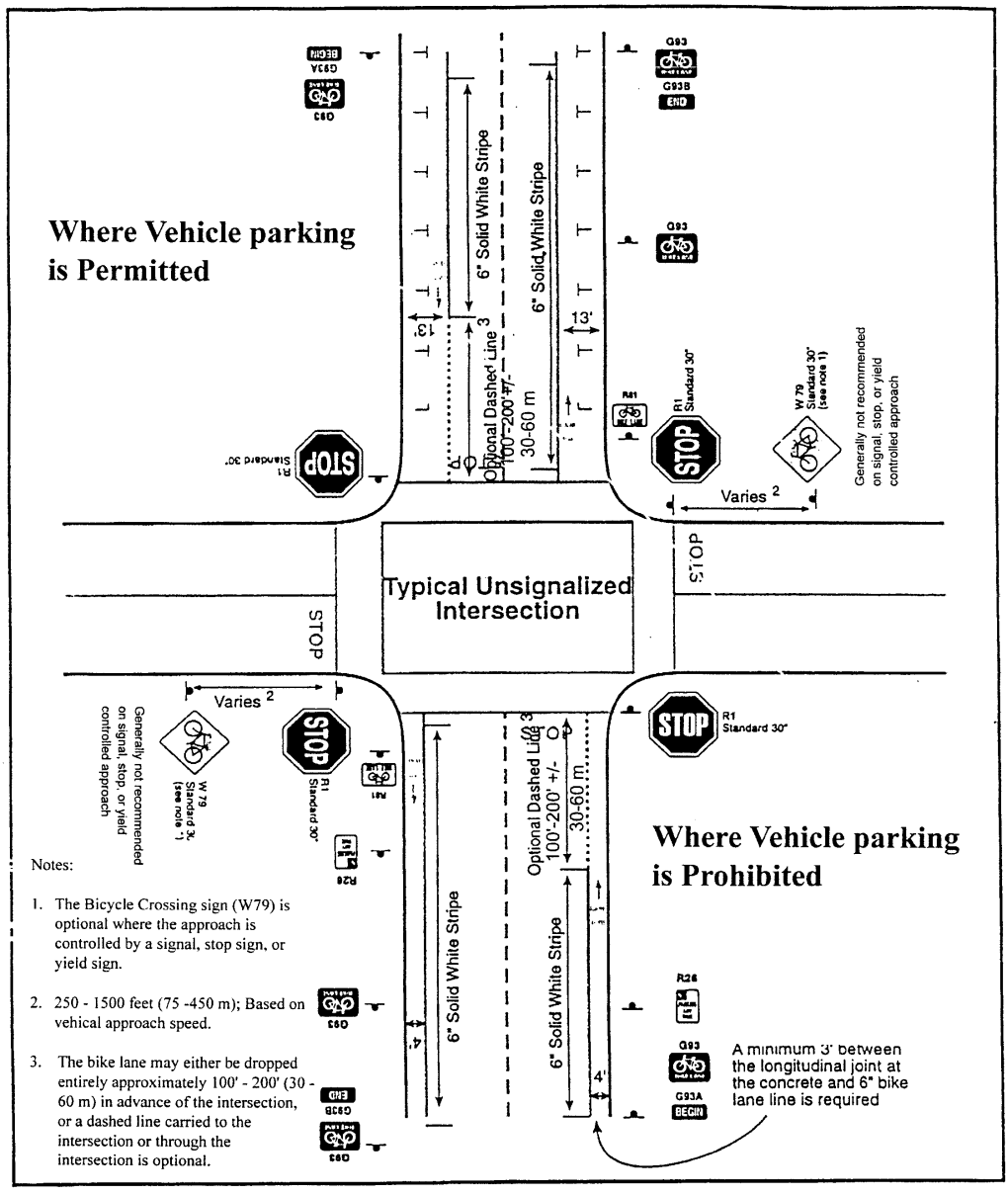
SIGN SIZE	DIMENSIONS (INCHES)												
	A	B	C	D	E	F	G	H	J	K	L	M	N
12 x 18	12	18	1/4	1/4	1-1/2	10	16	1/4	4	3/4	4-1/2	4D	1-3/4
18 x 24	18	24	3/8	1/2	1-1/2	15	21	1/2	5	1	6	5D	2-1/2

COLORS
BORDER & LEGEND - GREEN (Reflective)
BACKGROUND - WHITE (Reflective)

• THE POLICY FOR INTENDED USAGE OF THIS SIGN IS SHOWN ON REVERSE SIDE •

CHIEF, OFFICE OF SIGNS AND DELINEATION — 4/23/96 DATE — REVISION — REVISION

Figure 20: Numbered Bike Route Signs



Notes:

1. The Bicycle Crossing sign (W79) is optional where the approach is controlled by a signal, stop sign, or yield sign.
2. 250 - 1500 feet (75 -450 m); Based on vehical approach speed.
3. The bike lane may either be dropped entirely approximately 100' - 200' (30 - 60 m) in advance of the intersection, or a dashed line carried to the intersection or through the intersection is optional.

Figure 21: Signing at Unsignalized Intersections

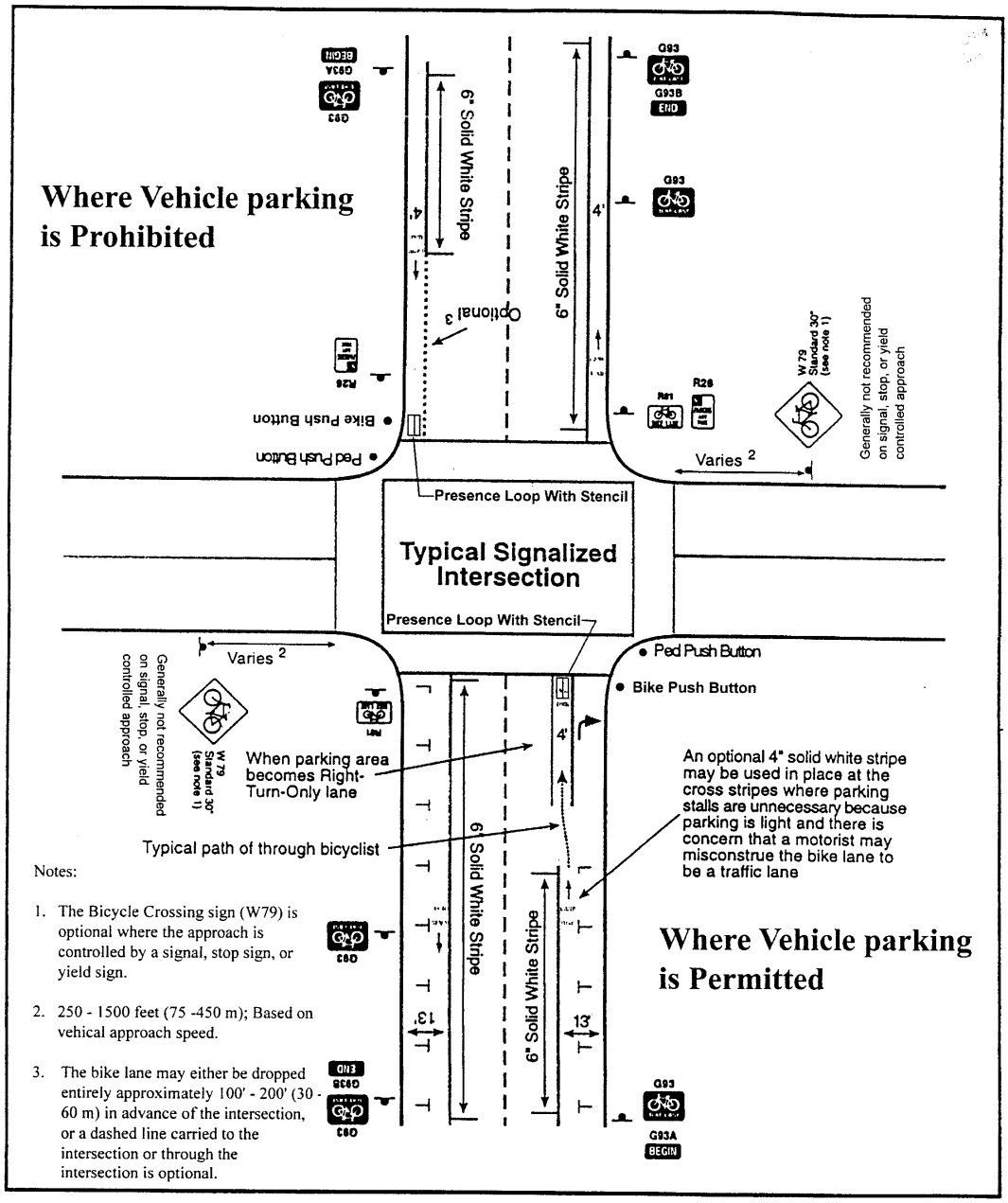


Figure 22: Signing at Signalized Intersections

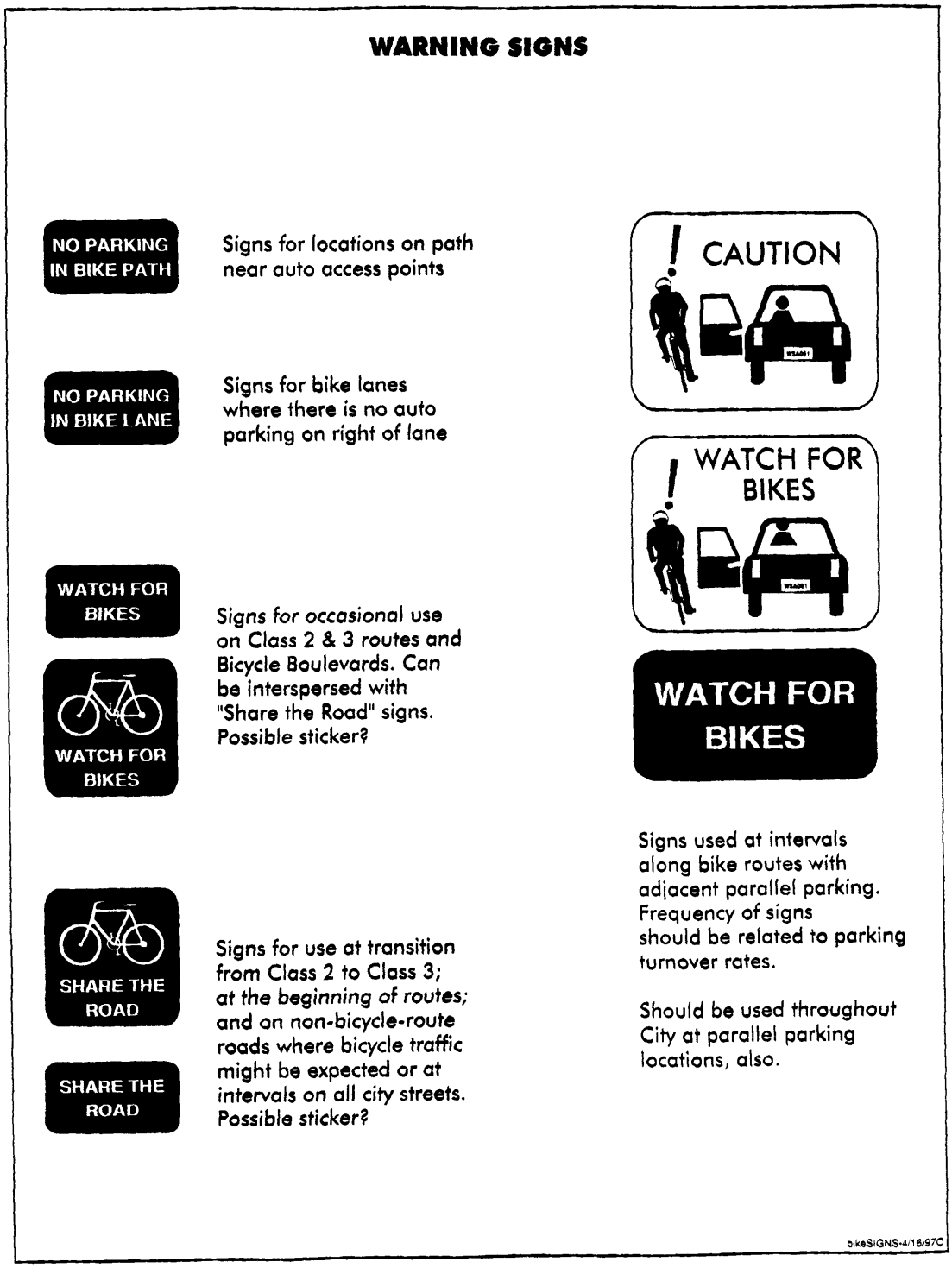


Figure 23: Warning Signs

5.5.4 New and retrofitted traffic signals should provide bicycle-sensitive detectors and/or signal buttons near the curb to help bicyclists trigger actuated signals.

5.6 Monitoring, Maintenance, and Security

5.6.1 *Monitoring*

Once the plan has been adopted, a monitoring effort is required to ensure that the recommendations are enforced over time. The following actions are recommended to achieve this.

Action: *A bicycle coordinator may be an effective position to help the cities and County implement the primary and local bikeway system. Coordinators could be full or part time employees, preferably located in Public Works or Planning Departments, and would be responsible for many of the monitoring responsibilities. They could also be responsible for coordinating with planning, recreation and parks, police, and other departments.*

Action: *Plan Review. All development and infrastructure improvement plans could be routed through a bicycle coordinator to ensure that bikeway segments are implemented, developer requirements are being met, and design standards adhered to.*

Action: *Accident monitoring. A coordinator could annually collect and evaluate bicycle-related accident data from the police department to determine areas of concern.*

Action: *Marketing/Public Awareness. A coordinator could work closely with the bicycling community to stimulate and assist with promotional and educational events, safety fairs, and programs.*

Action: *Maintenance. A coordinator could be responsible for an annual maintenance and operations budget and coordinating with the Public Works Departments. A coordinator could help direct the public to the appropriate city department for maintenance needs.*

Action: *Funding. A coordinator could work closely with adjacent cities and with agencies such as Caltrans to keep abreast of funding opportunities and prepare application packages.*

Action: *Enforcement/Security. A coordinator could serve as liaison to the local police department to provide needed enforcement and safety education along bike paths. Also, problems regarding security, privacy, vandalism, and crime along bike paths could be addressed through a coordinator.*

5.6.2 *Maintenance*

The total annual maintenance cost of the primary bikeway system is estimated to be about $150,000 when it is fully implemented. All of the maintenance costs are associated with the proposed off-road bike paths, assuming bike lanes and routes are maintained as part of routine roadway maintenance. Class I bike path maintenance costs are based on $10,000 per mile, which covers labor, supplies, and amortized equipment costs for weekly trash removal, monthly sweeping, and bi-annual resurfacing and repair patrols.

Maintenance access on the city-controlled Class I bike paths will be achieved using standard City pick-up trucks on the pathway itself. Sections with narrow widths or other clearance restrictions should be clearly marked. Class I bike path maintenance includes cleaning, resurfacing and re-striping the asphalt path, repairs to crossings, cleaning drainage systems, trash removal, and landscaping. Underbrush and weed abatement should be performed once in the late spring and again in mid-summer. Table 11b provides details of standard bikeway maintenance schedule.

Action: *Identify a reliable source of funding to cover Class I bike path maintenance throughout the County. All proposed designs should be closely examined to minimize future maintenance costs.*

Action: *Ensure that bicycles are addressed in all construction management efforts, including detours, signing, and surface quality standards.*

Action: *Ensure that street surface conditions are acceptable for bicycle travel following roadway construction in term of smoothness.*

Action: *Develop strict construction standards for the final street surface treatment, espcially the transition between asphalt and concrete at the gutter pan.*

5.6.3 *Security*

Security may be an issue along portions of the proposed Class I bike paths. Evaluation of specific security issues along these paths as well as the following actions are recommended to address concerns.

Action: *The responsible Police Departments, using both bicycles and motor vehicles, should perform Enforcement of applicable laws on the County's and Cities bike paths. Enforcement of vehicle statutes relating to bicycle operation will be enforced on Class II and Class III bikeways as part of the County's and cities' normal operations. No additional manpower or equipment is anticipated for Class II or III segments.*

Action: *Normal bike path hours of operation should be 6am to 9pm, unless otherwise specified.*

Table 11b
Bicycle Maintenance Schedule

Item	Frequency
Sign replacement/repair	1-3 years
Pavement marking replacement	1-3 years
Tree, Shrub, & grass trimming/fertilization	5 months- 1 year
Pavement sealing/potholes	5-15 years
Clean drainage system	1 year
Pavement sweeping	Monthly - annually as needed
Shoulder and grass mowing	as needed
Trash disposal	as needed
Lighting replacement/repair	1 year
Graffiti removal	Weekly - monthly as needed
Maintain furniture	1 year
Fountain/restroom cleaning/repair	Weekly - monthly as needed
Pruning	1-4 years
Bridge/tunnel inspection	1 year
Remove fallen trees	As needed
Weed control	Monthly - as needed
Maintain emergency telephones, CCTV	1 year
Maintain irrigation lines/replace sprinklers	1 year
Irrigate/water plants	Weekly - monthly as needed

Many of these maintenance items are dependent on the type and amount of landscaping and supporting infrastructure that is developed along the trail. It is recommended that a consistent maintenance procedure be developed to ensure, at a minimum, that the facility is safe for trail users. There should be a mechanism to identify, record, and respond to maintenance problems, and to keep written records of such actions.

6.0 Implementation Strategy

This section identifies costs for the proposed bicycle improvements, plus strategies on funding and financing.

6.1 Selection of Projects

One of the primary goals of this County Bicycle Plan is to coordinate implementation efforts between jurisdictions, to ensure that the County and each local agency receives its fair share of competitive funding, and to help prioritize projects so that those projects providing the greatest benefit are implemented in the short term.

This plan recognizes that cooperation between local agencies in the selection of priority projects and the allocation of local funding (such as TDA monies) is critical to ensuring an orderly implementation of an effective bicycle system.

Recommendation:

Short term projects identified in this plan represent the highest priority bicycle projects in San Mateo County. Local available matching funds, such as TDA, should be allocated whenever possible to these projects. The actual schedule for implementation on a year-to-year basis should be determined by (a) the readiness of each project in terms of local support, (b) CEQA approvals, (c) right-of-way control, (d) timing with other related improvements, and/or (e) success in obtaining competitive funding.

The C/CAG and BPAC staff should monitor the short term projects identified in this Plan and subsequent updates, and keep a year-to-year list of projects and their TDA and other local funding allocations. Should a project not be ready or able to utilize its allocation, it may trade with another short term project. This process eliminates the constant evaluation of new projects and ensures that viable top priority projects have access to matching funding. It provides each city and local agency a 5 to 10 year schedule so that they may program their resources and feel assured that their project will be implemented in the short term. Each year the C/CAG BPAC and staff will review the list of projects slated for that year, review the project readiness of each project to be funded, and listen to requests for changes to the sequencing of the projects.

This process does not preclude cities and local agencies from continuing to submit other local projects for consideration for TDA and other funding.

6.2 Cost Breakdown

Costs are separated between bicycle facilities and programs. A complete breakdown of costs for short/mid-term bicycle projects is presented in Table 12, and program costs are shown in Table 13. The total cost over 10 years is estimated at $28,000,000, with Class I Multi-use paths representing 50% of the total costs. It is important to note that costs for the interchange improvements have been estimated at $2 million each, even though the type of improvement is not known at this time. Final improvements may significantly increase these costs. Table 14 presents a more detailed breakdown of the funding sources by project over the next 20 years. Of the total project costs over 20 years, it is projected that Individual cities will be responsible for about 13% of the costs. While the vast majority of funding will be state or federal funding. It is important to note that while many of the projects can be funded with federal, state, and regional transportation, safety, and/or air quality grants, others are recreational in nature and must be funded by local or private sources.

The top 15 projects are recommended to be implemented over the next ten years, or as funding is available. It also presents a 'best case' scenario for San Mateo County and cities, providing a network of bicycle facilities and programs within the short term. Some of the more expensive projects may take longer to implement. It is important to note that many of the funding sources are highly competitive, and therefore impossible to determine exactly which projects will be funded by which funding sources. Timing of projects is also difficult to pinpoint exactly, due to dependence on competitive funding sources, timing of roadway and development projects, and the overall economy.

6.3 Funding

There are a variety of potential funding sources including local, state, regional, and federal funding programs that can be used to construct the proposed bicycle improvements. Most of the Federal, state, and regional programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits. Local funding for bicycle projects typically comes from Transportation Development Act (TDA) funding, which is prorated to each community based on return of gasoline taxes. Funding for many of the programs would need to be funded either with TDA, general fund (staff time), or possibly private grants. Table 12 presents a summary of available funding along with timing, criteria, and funding agency.

Table 12

San Mateo County Bikeway System
Cost Estimates

Segment	Year	Improvements	Length	Cost	Total Cost
SHORT-MID TERM (YEARS 10)			(miles)		
1. North-South Bikeway (Signing/Detectors)			37.4		$ 560,700
Menlo Park		Signs/detectors	2.4	$ 36,450	
Atherton/Caltrans		Signs/detectors	3.1	$ 46,875	
San Mateo County		Signs/detectors	0.9	$ 13,125	
Redwood City/Caltrans		Signs/detectors	3.4	$ 50,625	
San Carlos		Signs/detectors	1.9	$ 28,125	
Belmont		Signs/detectors	1.5	$ 22,500	
San Mateo		Signs/detectors	4.4	$ 66,000	
Burlingame		Signs/detectors	3.5	$ 52,500	
Millbrae		Signs/detectors	1.7	$ 25,125	
San Bruno		Signs/detectors	3.8	$ 56,250	
South San Francisco		Signs/detectors	4.7	$ 70,875	
Colma		Signs/detectors	1.9	$ 27,750	
Daly City		Signs/detectors	1.7	$ 25,500	
Brisbane		Signs/detectors	2.6	$ 39,000	
2. BART-SFO Bikeway Project			8.3		$ 1,538,900
Millbrae		Class II/III	0.9	$ 16,500	
Millbrae		Class I	0.9	$ 330,000	
San Bruno		Class II/III	2.4	$ 39,600	
South San Francisco		Class I	2.4	$ 924,000	
South San Francisco		Class II/III	0.5	$ 19,800	
Colma		Class II/III	1.3	$ 209,000	
3. Ralston Avenue Bikeway (Interchange Improvements)					$ 3,140,000
Belmont		U.S. 101 Bridge		$ 2,000,000	
		ECR Bridge		$ 1,000,000	
		Other Bikeway Impvts		$ 100,000	
		Lockers		$ 40,000	
4. North-South Bikeway (South Section)			8.8		$ 220,750
Menlo Park		Class II/III	2.4	$ 60,750	
Atherton/Caltrans		Class II/III	3.1	$ 78,125	
San Mateo County		Class II/III	0.9	$ 21,875	
Redwood City/Caltrans		Class II/III	2.4	$ 60,000	
5. San Mateo Bay Trail					
Redwood City		Class I	5	$ 2,000,000	$ 2,000,000
6. Recreational Route Bikeway Imp.			22.8		$ 2,281,818
Alpine Road (County, Portola Valley)		Class III/Shoulders, etc.	4	$ 400,000	
Portola Road (Portola Valley, Woodside)		Class III/Shoulders, etc.	3.8	$ 375,000	
Mountain Home Rd. (Woodside)		Class III/Shoulders, etc.	1.8	$ 175,000	
Canada Road (Woodside, County)		Class III/Shoulders, etc.	6.8	$ 675,000	
La Honda Road (Caltrans, Woodside)		Class III/Shoulders, etc.	3.0	$ 300,000	
Skyline Boulevard (Caltrans, County)		Class III/Shoulders, etc.	3.6	$ 356,818	
7. North Coast Bikeway			9.1		$ 748,750
Pacifica		Class I	1.9	$ 570,000	
Pacifica		Class II/III	3.3	$ 81,250	
Daly City		Class II/III	3.9	$ 97,500	
8. North-South Bikeway (Old County Road Section)			5.7		$ 279,375
Redwood City		Class II/III	1.0	$ 25,000	
San Carlos		Class II/III	1.9	$ 46,875	
Belmont		Class II/III	1.5	$ 37,500	
San Mateo		Class II/III	0.8	$ 20,000	
San Mateo		Class I	0.5	$ 150,000	

Table 12

San Mateo County Bikeway System
Cost Estimates Continued…

9. Coastside Bikeway Projects		8.5		$ 1,412,500
County/Caltrans	Class III/Shoulders, etc.	5	$ 500,000	
Half Moon Bay	Class II/III	0.5	$ 12,500	
Half Moon Bay and Area	Class I	3.0	$ 900,000	
10.US 101/Willow Road Interchange				
Menlo Park/East Palo Alto/Caltrans	Crossing Improvements		$ 2,000,000	$ 2,000,000
11. North-South Bikeway (Bayshore Section)				
		5.7		$ 142,500
San Bruno	Class II/III	0.5	$ 12,500	
South San Francisco	Class II/III	2.6	$ 65,000	
Brisbane	Class II/III	2.6	$ 65,000	
12. US 101/Broadway Interchange				
Burlingame/Caltrans	Crossing Improvements		$ 2,000,000	$ 2,000,000
13. North-South Bikeway (Delaware-California)		7.8		$ 193,750
San Mateo	Class II/III	3.0	$ 75,000	
Burlingame	Class II/III	3.5	$ 87,500	
Millbrae	Class II/III	1.3	$ 31,250	
14. Crytsal Springs-3rd/4th Avenue Bikeway		4.8		$ 2,118,750
San Mateo	Class II/III	4.75	$ 118,750	
San Mateo (interchange)	Crossing Improvements		$ 2,000,000	
15. SFIA East Side/Bay Trail Project		3.4		$ 9,493,000
Millbrae/SFIA	Class I/overpass	1.6	$ 4,312,000	
San Bruno/SFIA	Class I/overpass	1.8	$ 5,181,000	
Sub-Total				**$ 28,130,793**

Table 13

San Mateo County Bikeway System
Program Cost Estimates

	Unit Cost	Descr	Units	Cost	Notes
Class I Maintenance	$ 10,000.00	Mi/Year	14.6	$ 146,000	See List
Class II/III Maintenance	$ 2,000.00	Mi/Year	73.1	$ 146,200	Sweeping
Bicycle Parking					
Class I Bike Lockers	$ 1,600.00	EA/2 bikes	100	$ 160,000	Public Locations
Class II Bike Racks	$ 150.00	EA/12 bikes	500	$ 75,000	Public Locations
Bicycle Corrals	$ 450.00	EA/40 bikes	40	$ 18,000	Schools/events
Bike Stations	$ 100,000	EA/40 bikes	4	$ 400,000	major destinations
Bicycle Education					
Safety Grants	$ 20,000.00	Year	20	$ 400,000	Safety programs taught in 3rd/4th grades
Safety Materials	$ 5,000.00	Every 5 years	4	$ 20,000	Updated safety materials
School Commute Program	$ 5,000.00	Year	20	$ 100,000	Safety Coordinator
Bicycle Lender/Repair Program	$ 2,500.00	Year	20	$ 50,000	Coordination
Community Adoption Program	$ 2,500.00	Year	20	$ 50,000	Coordination
Bike Fairs/Races	$ 2,500.00	Year	20	$ 50,000	Coordination
Employer Incentives	$ 2,500.00	Year	20	$ 50,000	Coordination
Bike-to-Work Days	$ 2,500.00	Year	20	$ 50,000	Coordination
		20-Year Cost		**$ 1,715,200**	
		Avrg. Cost/Year		**$ 85,760**	

Note: costs reflect new short/mid-term programs and projects only.

Table 14

San Mateo County Bikeway System
Projects by Funding Source

(estimates)

	Local	Regional	State	Federal	Private/ Other	Total
1. North-South Bikeway (Signing/Detectors)						
Menlo Park	$ 3,645	$ 5,468	$ 7,290	$ 20,048		$ 36,450
Atherton/Caltrans	$ 4,688	$ 7,031	$ 9,375	$ 25,781		$ 46,875
San Mateo County	$ 1,313	$ 1,969	$ 2,625	$ 7,219		$ 13,125
Redwood City/Caltrans	$ 5,063	$ 7,594	$ 10,125	$ 27,844		$ 50,625
San Carlos	$ 2,813	$ 4,219	$ 5,625	$ 15,469		$ 28,125
Belmont	$ 2,250	$ 3,375	$ 4,500	$ 12,375		$ 22,500
San Mateo	$ 6,600	$ 9,900	$ 13,200	$ 36,300		$ 66,000
Burlingame	$ 5,250	$ 7,875	$ 10,500	$ 28,875		$ 52,500
Millbrae	$ 2,513	$ 3,769	$ 5,025	$ 13,819		$ 25,125
San Bruno	$ 5,625	$ 8,438	$ 11,250	$ 30,938		$ 56,250
South San Francisco	$ 7,088	$ 10,631	$ 14,175	$ 38,981		$ 70,875
Colma	$ 2,775	$ 4,163	$ 5,550	$ 15,263		$ 27,750
Daly City	$ 2,550	$ 3,825	$ 5,100	$ 14,025		$ 25,500
Brisbane	$ 3,900	$ 5,850	$ 7,800	$ 21,450		$ 39,000
2. BART-SFO Bikeway Project						
Millbrae	$ 1,650	$ 8,250	$ 3,300	$ 3,300		$ 16,500
Millbrae	$ 33,000	$ 165,000	$ 66,000	$ 66,000		$ 330,000
San Bruno	$ 3,960	$ 19,800	$ 7,920	$ 7,920		$ 39,600
South San Francisco	$ 369,600	$ 184,800	$ 184,800	$ 184,800		$ 924,000
South San Francisco	$ 1,980	$ 9,900	$ 3,960	$ 3,960		$ 19,800
Colma	$ 20,900	$ 104,500	$ 41,800	$ 41,800		$ 209,000
3. Ralston Avenue Bikeway (Interchange Improvements)						
Belmont	$ 314,000	$ 471,000	$ 628,000	$ 1,727,000		$ 3,140,000
4. North-South Bikeway (South Section)						
Menlo Park	$ 6,075	$ 9,113	$ 12,150	$ 33,413		$ 60,750
Atherton/Caltrans	$ 7,813	$ 11,719	$ 15,625	$ 42,969		$ 78,125
San Mateo County	$ 2,188	$ 3,281	$ 4,375	$ 12,031		$ 21,875
Redwood City/Caltrans	$ 6,000	$ 9,000	$ 12,000	$ 33,000		$ 60,000
5. San Mateo Bay Trail						
Redwood City	$ 200,000	$ 300,000	$ 400,000	$ 1,100,000		$ 2,000,000
6. Recreational Route Bikeway Imp.						
Alpine Road (County, Portola Valley)	$ 40,000	$ 60,000	$ 80,000	$ 220,000		$ 400,000
Portola Road (Portola Valley, Woodside)	$ 37,500	$ 56,250	$ 75,000	$ 206,250		$ 375,000
Mountain Home Rd. (Woodside)	$ 17,500	$ 26,250	$ 35,000	$ 96,250		$ 175,000
Canada Road (Woodside, County)	$ 67,500	$ 101,250	$ 135,000	$ 371,250		$ 675,000
La Honda Road (Caltrans, Woodside)	$ 30,000	$ 45,000	$ 60,000	$ 165,000		$ 300,000
Skyline Boulevard (Caltrans, County)	$ 35,682	$ 53,523	$ 71,364	$ 196,250		$ 356,818
7. North Coast Bikeway						
Pacifica	$ 5,700	$ 8,550	$ 11,400	$ 31,350		$ 57,000
Pacifica	$ 8,125	$ 12,188	$ 16,250	$ 44,688		$ 81,250
Daly City	$ 97,500	$ 146,250	$ 195,000	$ 536,250		$ 975,000
8. North-South Bikeway (Old County Road Section)						
Redwood City	$ 2,500	$ 3,750	$ 5,000	$ 13,750		$ 25,000
San Carlos	$ 4,688	$ 7,031	$ 9,375	$ 25,781		$ 46,875
Belmont	$ 3,750	$ 5,625	$ 7,500	$ 20,625		$ 37,500
San Mateo	$ 2,000	$ 3,000	$ 4,000	$ 11,000		$ 20,000
San Mateo	$ 15,000	$ 22,500	$ 30,000	$ 82,500		$ 150,000
9. Coastside Bikeway Projects						
County/Caltrans	$ 50,000	$ 75,000	$ 100,000	$ 275,000		$ 500,000
Half Moon Bay	$ 1,250	$ 1,875	$ 2,500	$ 6,875		$ 12,500
Half Moon Bay and Area	$ 90,000	$ 135,000	$ 180,000	$ 495,000		$ 900,000

Table 14

San Mateo County Bikeway System Projects by Funding Source Continued...

10.US 101/Willow Road Interchange							
Menlo Park/East Palo Alto/Caltrans	$ 200,000	$ 300,000	$ 400,000	$ 1,100,000		$ 2,000,000
11. North-South Bikeway (Bayshore Section)						
San Bruno	$ 1,250	$ 1,875	$ 2,500	$ 6,875		$ 12,500
South San Francisco	$ 6,500	$ 9,750	$ 13,000	$ 35,750		$ 65,000
Brisbane	$ 6,500	$ 9,750	$ 13,000	$ 35,750		$ 65,000
12. US 101/Broadway Interchange						
Burlingame/Caltrans	$ 200,000	$ 300,000	$ 400,000	$ 1,100,000		$ 2,000,000
13. North-South Bikeway (Delaware-California)						
San Mateo	$ 7,500	$ 11,250	$ 15,000	$ 41,250		$ 75,000
Burlingame	$ 87,500	$ 131,250	$ 175,000	$ 481,250		$ 875,000
Millbrae	$ 3,125	$ 4,688	$ 6,250	$ 17,188		$ 31,250
14. Crytsal Springs-3rd/4th Avenue Bikeway						
San Mateo	$ 11,875	$ 17,813	$ 23,750	$ 65,313		$ 118,750
San Mateo (interchange)	$ 200,000	$ 300,000	$ 400,000	$ 1,100,000		$ 2,000,000
15. SFIA East Side/Bay Trail Project						
Millbrae/SFIA	$ 431,200	$ 646,800	$ 862,400	$ 2,371,600		$ 4,312,000
San Bruno/SFIA	$ 518,100	$ 777,150	$ 1,036,200	$ 2,849,550		$ 5,181,000
Sub-Total	$ 3,090,279	$ 4,481,034	$ 5,626,159	$ 14,933,321		$ 28,130,793
Per Year, Years 1-10	$ 309,028	$ 448,103	$ 562,616	$ 1,493,332		$ 2,813,079
Note: estimates only. Most funds are competitive, and vary from year to year.						

Transportation Equity Act for the 21st Century (TEA-21)

TEA-21 was adopted by both houses of Congress on May 22, 1998. Much of the delay in adopting the new transportation legislation was the result of conflicts between donor and recipient states (states that received more or less money than they paid in gas taxes) under the old transfer arrangements. The new formulas will rectify the past imbalances, allowing large donor states with higher amounts that can be transferred between various funding programs. The follow-up to ISTEA, TEA-21 offers some important changes in funding opportunities.

1. The Surface Transportation Program (STP) was amended as follows:

   - Approximately $33 billion available nationwide.
   - Bicycle and pedestrian projects remain eligible.
   - Sidewalk improvements to comply with the Americans with Disabilities Act (ADA) are now eligible for Surface Transportation Program funds.

2. The National Highway System (NHS) program was amended as follows:

   - Pedestrian projects may now be funded with NHS funds.
   - NHS funds may now used on bicycle and pedestrian projects within Interstate corridors.

3. The Transportation Enhancement Activities (TEA) program was amended as follows:

   - $3.3 billion available nationwide
   - Bicycle and pedestrian safety and education programs
   - Tourist and welcome centers
   - Environmental mitigation to provide wildlife corridors
   - Requirement that each project be directly related to a surface *transportation* project
   - Eighty (80) percent Federal matching requirement applies only to total non-Federal share rather than total project cost.
   - Twenty-five (25) percent of the TEA funds received over the amount received in FY 1997 may be transferred to other STP activities.
   - Eight (8) specific projects are funded off the top of the TEA program, none in the Western United States.

4. The Congestion Mitigation and Air Quality Improvements (CMAQ) program was amended as follows:

   - $8.12 billion available nationwide
   - Bicycle project eligibility remains essentially the same

- A small percentage can be transferred to other programs

5. The Recreational Trails Program was amended as follows:

   - $270 million available nationwide over the next six years
   - Bicycle project eligibility remains essentially the same

6. The Hazard Elimination Program was amended as follows:

   - Now can be used for bicycling and walking hazards
   - Definition of a "public road" now expanded to include bikeways, pathways, and traffic calming measures.

7. A new category, Transit Enhancements Program, was created that calls for transit agencies in urbanized areas over 200,000 population to use 1 percent of their Urban Formula Funds for Transit Enhancements Activities. Up to $50 million per year may be available for pedestrian access, walkways, bicycle access, bike storage facilities, and bike-on-bus racks. The program calls for 95% Federal/5% local match.

8. Scenic Byway, bridge repair, transit, safety (non-construction), and Federal Lands programs all remain essentially the same under TEA-21, with the amounts either the same or increasing from ISTEA.

9. Planning provisions for states and MPO's have been streamlined, with bicycle and pedestrian needs to be given due consideration in the development of comprehensive transportation plans. Specific policies include directives to not approve any project or regulatory action that will have an adverse impact on non-motorized safety, unless a reasonable alternative route is provided or already exists.

10. When state or local regulations permit, allow use of bicycle facilities by electric bicycles and motorized wheelchairs.

11. Railway-highway crossings should consider bicycle safety.

12. A new Surface Transportation-Environment Cooperative Research Program is established for funding non-motorized research.

13. In cooperation with AASHTO, ITE, and other groups, establish new bicycle design guidelines within 18 months.

A detailed program-by-program of available funding programs along with the latest relevant information is provided on the following pages. Specific amounts and deadlines are not yet identified for some of the TEA-21 programs.

Federal funding through the TEA-21 (Transportation Enhancements Act) program will provide the bulk of outside funding. TEA-21 currently contains three major programs, STP (Surface Transportation Program), TEA (Transportation Enhancement Activities), and CMAQ (Congestion Mitigation and Air Quality Improvement) along with other programs such as the National Recreational Trails Fund, Section 402(Safety) funds, Scenic Byways funds, and Federal Lands Highway funds.

Summary of Funding Sources
Table 15

Grant Source	Due Date	Agency	Annual Total	Matching Requirement	Eligible Applicants	Eligible Bikeway Projects			Comments
						Commute	Recreation	Safety/ Education	
Federal Funding									
F1. TEA-21 Surface Transportation Program (STP)	pending	Regional Transportation Agency, Caltrans, FHWA		20% non-federal match	federally certified jurisdictions	X	X		STP funds may be exchanged for local funds for non-federally certified local agencies; no match required if project improves safety
F2. TEA-21 Congestion Mitigation and Air Quality Program	pending	Regional Transportation Agency, CTC		20% non-federal match	federally certified jurisdictions	X			Counties redesignated to attainment status for ozone may lose this source
F3. TEA-21 Transportation Enhancement Activities (TEA)	pending	FHWA, Regional Transportation Agency		20% non-federal match	federally certified jurisdictions	X	X		Contact the Regional Transportation Agency
F4. TEA-21 National Recreational Trails	pending	State Dept. of Parks & Recreation		no match required	jurisdictions, special districts, non profits with management responsibilities over the land		X		For recreational trails to benefit bicyclists, pedestrians, and other users; contact State Dept. of Parks & Rec. , Statewide Trails Coordinator, (916) 653-8803

State Funding

Summary of Funding Programs (Continued)

S2. State and Local Transportation Partnership Program (SLPP)		Caltrans		none	Cities, counties, assessment districts authorized to impose taxes/fees or construct transportation facilities	X	X		Any road projects being resurfaced or using local funds should include bike lane for reimbursement through this program; contact Caltrans
S3. Environmental Enhancement and Mitigation (EEM) Program	Nov.	State Resources Agency		not required but favored	local, state and federal government non-profit agencies	X	X	X	Projects that enhance or mitigate future transportation projects; contact EEM Project Manager (916) 653-5800
Local Funding									
L1. Transportation Development Act Article 13 (TDA) (2% of total TDA)	Jan.	Regional Transportation Agency		no match required	cities, counties; currently allocated by population	X	X	X	Contact the Regional Transportation Agency
L2. State Gas Tax (local share)		Allocated by State Auditor Controller		no match required	local jurisdictions	X		X	
L3. Developer Fees or Exactions (developer fee for street improvements - DFSI)		Cities, or County		no match required		X	X	X	Mitigation required during land use approval process
L4. Vehicle Registration Surcharge Fee (AB 434)		Air Quality Control District		no match required	local agencies, transit operators, others	X	X	X	competitive program for projects that benefit air quality
L5. Vehicle Registration Surcharge Fee (AB 434)		Air Quality Control District, or Congestion Management Agency		no match required	local jurisdictions	X	X	X	Funds are distributed to communities based on population

TEA-21 funding is administered through the state (Caltrans or Resources Agency) and regional governments (Metropolitan Transportation Commission). Most, but not all, of the funding programs are transportation versus recreational oriented, with an emphasis on (a) reducing auto trips and (b) providing an inter-modal connection. Funding criteria often includes completion and adoption of a bicycle master plan, quantification of the costs and benefits of the system (such as saved vehicle trips and reduced air pollution), proof of public involvement and support, CEQA compliance, and commitment of some local resources. In most cases, TEA-21 provides matching grants of 80 to 90 percent--but prefers to leverage other moneys at a lower rate.

With an active and effective regional agency such as the Metropolitan Transportation Commission, Sausalito should be in a good position to secure more than its fair share of TEA-21 funding. It will be critical to get the local state assemblyman and senator briefed on these projects and lobbying Caltrans and the California Transportation Commission for these projects.

State

TDA Article III (SB 821)

Transportation Development Act (TDA) Article III funds are state block grants awarded annually to local jurisdictions for bicycle and pedestrian projects in California. These funds originate from the state gasoline tax and are distributed to local jurisdictions based on population.

AB 434/TFCA

Transportation for Clean Air (TFCA) formerly known as AB 434 funds, are available for clean air transportation projects, including bicycle projects, in California.

Bicycle Lane Account

The state Bicycle Lane Account (BLA) is an annual program that is available for funding bicycle projects. Available as grants to local jurisdictions, the emphasis is on projects which benefit bicycling for commuting purposes. While the fund is currently small ($700,000 available annually), it has been increased to $1 million/yr. starting in FY 1999 with an increase to $3 million/year by the state assembly and senate.

Regional

The Bay Area Air Quality Management District is a major potential source of funding for bicycle and pedestrian programs. The grants are generally in the $50,000 to $200,000 range and are highly competitive based on a cost-benefit formula developed by the

District. Funding priorities also change annually with the District, between bicycle and other projects such as transit and electric bicycle/vehicle uses.

Local

New Construction

Future road widening and construction projects are one means of providing bike lanes. To ensure that roadway construction projects provide bike lanes where needed, it is important that an effective review process is in place to ensure that new roads meet the standards and guidelines presented in this master plan.

Impact Fees

Another potential local source of funding are developer impact fees, typically tied to trip generation rates and traffic impacts produced by a proposed project. A developer may reduce the number of trips (and hence impacts and cost) by paying for on- and off-site bikeway improvements which will encourage residents to bicycle rather than drive. In-lieu parking fees may be used to help construct new or improved bicycle parking. Establishing a clear nexus or connection between the impact fee and the project's impacts is critical in avoiding a potential lawsuit.

Mello Roos

Bike paths, lanes, and pedestrian facilities can be funded as part of a local assessment or benefit district. Defining the boundaries of the benefit district may be difficult unless the facility is part of a larger parks and recreation or public infrastructure program with broad community benefits and support.

Other

Local sales taxes, fees, and permits may be implemented, requiring a local election. Volunteer programs may substantially reduce the cost of implementing some of the proposed pathways. Use of groups such as the California Conservation Corp (who offer low cost assistance) will be effective at reducing project costs. Local schools or community groups may use the bikeway or pedestrian project as a project for the year, possibly working with a local designer or engineer. Work parties may be formed to help clear the right of way where needed. A local construction company may donate or discount services. A challenge grant program with local businesses may be a good source of local funding, where corporations 'adopt' a bikeway and help construct and maintain the facility. Finally, some cities use a franchise tax assessed to local services such as trash collection to construct and maintain roadway improvements, which may include on-street bikeway improvements.

Other opportunities for implementation will appear over time which may be used to implement the system.

6.4 Financing

Proposed improvements and programs to be developed over the next 20 years in San Mateo County have been analyzed to determine the annual financing requirements, and to allow the City to budget its resources and target funding applications. It is important to note that the majority of funding for bicycle projects is expected to be derived from federal sources, TEA-21. These funding sources are extremely competitive, and require a combination of sound applications, local support, and lobbying on the regional and state level.

San Mateo County has historically invested approximately $1,750 annually in bicycle facilities, in the form of bike lane and bike path construction and maintenance. Often these items are included in larger construction and maintenance projects, and specific line item accounts are not kept. Therefore, the annual expenditure figure is an estimate based on the City's Public Works Department review.

Technical Appendix

Appendix A
Street Cross Sections

Note: for planning purposes only.
Further design and engineering review required.